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CYST OF THE RIGHT OPTIC DISC, CHOROIDITIS,
MACULAR HEMORRHAGE.*

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WILLS' EYE HOSPITAL, PHILADELPHIA; ILLUSTRATED
WITH COLORED FRONTISPIECE.

Mrs. A. H., a Polish woman, aged 38, presented herself at the Philadelphia Polyclinic, on October 24th, 1895, complaining of impaired vision in both eyes and violent tempero-occipital headache. The pain was constant, but greatly aggravated by exposure to bright light, or by any attempt to use the eyes. Vision was reduced to 1/60 in each eye, while only large type could be deciphered at her selected near point. The corneae were transparent, excepting a few gray opacities scattered around the periphery of both. The lens and vitreous were transparent in each eye.

*Read before the American Ophthalmological Society at New London, Conn., July, 1896.

The ophthalmoscopic picture presented in each eye has been so carefully depicted in the admirable painting by Miss Washington, that any extended description is unnecessary. The right eye ground alone is here shown, but the left differed from it, so far as the general conditions of the fundus are concerned, only in the minute details. The macular hemorrhage and cyst were, however, absent in the left eye. The case is presented for permanent record in the annals of this society, not because of the retino-choroidal disease, examples of which are unfortunately, only too common, but to record the presence of a peculiar cystoid body, situated on the head of the optic nerve, the location, relative size and general appearance of which are well shown in the sketch. There was a delicate greenish hue to the body, giving to the observer the impression of translucency, which has been lost in the painting and its reproduction.

There was myopic astigmatism present in both eyes, so that -2 D. was required for the study of the fundus, but the apex of the cyst could be clearly seen with $+3$ or $+3.50$ D. Its projection, therefore, above the plane of the disc was approximately 2mm. Directly below the cyst, but apparently not connected with it, were the remains of the hyaloid artery.

The precise nature or origin of this unique body upon the nerve must remain in uncertainty. I have not seen any similar appearance, and have not found any record of a similar case. There seems no rational connection between the disease of the fundus oculi and this curious cyst on the nerve. A more probable relation exists between it and the remains of the hyaloid artery; indeed, I was at first disposed to regard it as a cyst-like expansion of that vessel; but the most careful study shows no demonstrable connection between them, as is so obvious in the case presented by Mitvalsky.

*READING WITH DEFECTIVE VISION

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ILLUSTRATED.

A few cases of defective vision arising from various causes, and of stationary character, in persons who greatly deplored their inability to read, have induced me to examine the relations of acuity of vision and ability of reading. As a result of this examination, I constructed a little contrivance in the way of a reading glass, which proved successful in these cases. Although no new optic principle is involved, I thought it worth while to bring the matter before you, as it may be the means of benefiting some more of these patients.

The ability to read depends apart from a satisfactory function of the cortical centres on a sufficient degree of acuity of vision, Although for the easy performance of the act of reading a good field of vision is an important condition, experience shows that reading is possible with a defective field, and that even an extremely limited field as we find it for instance in Retinitis Pigmentosa, allows reading under some difficulty.

For the purpose in question, it will not be necessary to analyze the idea, "Acuity of Vision" and go back to its real meaning, but it will be sufficient to take the term as it is used in ordinary ophthalmological parlance, meaning the power of distinguishing letters of definite shape and size, in a definite distance. This ability of distinguishing letters depends on the size of their retinal images.

For reading the print of most our books and newspapers in the usual distance, the possession of the normal or average vision is by no means necessary. The size of book and newspaper type

*Paper read before the American Ophthalmological Society, at the 32nd Annual Meeting, in New London, July 16th, 1896.

is by far in excess of demanding this perfect vision, although it is necessary for making reading easy. If we had always to read at the limit of our acuteness of vision, we would not be able to keep it up for a long time. For the sake of ascertaining the size I have measured the type of a number of the principle newspapers with the microscope. I found most of the sizes very near the size of Jaeger number 4 (edition revised by Fuchs) or Snellen's fourth number ($D=1$). Smaller type is rather uncommon in books and newspapers. The distance at which the samples taken could actually be distinguished, agreed very well with the distance calculated. That is the distance at which the type would appear under an angle of 5 minutes. Of the two types named, Jaeger number 4 ought to be read by a person with vision 6-6 at a distance of 90 centimetres (36 inches) and is actually read by most persons with good vision at a distance of something over 100 centimetres (40 inches). Snellen number 4 appears under an angle of 5 minutes at the distance of 100 centimetres (40 inches), and is actually read at a distance of about 110 centimetres (44 inches).

The customary reading distance is about 12 inches (30 centimetres), or to take the limits, from 10 to 14 inches (25-35 centimetres). This is between one-third and one-fourth of the distance at which the types named can be distinguished, and consequently the retinal images of this type held in ordinary reading distance will be from three to four times larger than would be necessary for just distinguishing them; consequently a person with vision 6-18, and even 6-24, will be able to read this medium sized print in the ordinary reading distance.

This agrees very well with the observation which all of us make in our practice, that persons with failing vision do not become aware of their trouble by experiencing difficulty in reading, but by their inability to distinguish distant objects. Their acuteness of vision must have gone below 1-2, down to 1-3 or 1-4 before they experienced any great difficulty in ordinary reading at the usual distance.

Persons with an acuteness of vision below 6-36, are unable to read medium sized print, provided they are not myopic in a high degree. Myopes, with defective vision, have a large advantage over amblyopics of emmetropic or hypermetropic refraction. By bringing the reading matter near to their naked eye they enhance the size of their retinal images to such a degree—and the more the stronger the myopia is—that persons with a very defective vision surprise us by the smallness of the print which they

are able to read with ease. It may be remarked, in parenthesis, that the retinal images in axial myopia are anyhow larger than those of emmetropic and hypermetropic eyes, but this does not play a great part compared with the enlargement resulting from approach. This relative superiority in regard to reading of myopic eyes with defective vision shows us the way, as to how to help amblyopic patients of emmetropic and hypermetropic refraction. We have to enlarge the retinal images to such a degree as to bring type of a certain size within their acuteness of vision.

Amongst the means of enlarging, at our disposal, are the ordinary magnifying glass with a handle, the Bruecke-Chevalier Loupe and Steinheil's conus. Of these the magnifying glass, with handle, as sold by the opticians, is not of much use in the higher degrees of amblyopia. If it is to be of any larger size, its strength is limited by considerations of weight, so that the glasses are hardly stronger than 4-6 D. The enlargement attainable with such a glass as compared with the naked eye is very small and amounts only to a fraction of 1. Besides it is rather uncomfortable to hold the paper in one hand, the heavy glass in the other, to maintain the relative distances and at the same time move the head with the glass.

For these reasons the magnifying glass, as a reading glass, is little in use, a very much better showing makes Bruecke-Chevalier's Loupe. It is a Galilean telescope arranged for short range. The enlargement grows with its length. The instrument which I hand around for your inspection has a length of 10 centimetres (4 inches); its focal length is 26 centimetres, taken from the ocular, and the enlargement of an object, compared with its size, when looked at with the naked eye at this distance, is something over four-fold. The field of vision is small in every telescope; in this particular instrument it is $20^{\circ} 20'$. This narrowness of the field and the large lateral displacement of the images at the slightest moving, detract seriously from the practical usefulness of the instrument. As far as I know, Bruecke-Chevalier Loupe is not commonly used as a reading glass.

Steinheil's Conus is a Galilean telescope, made of one piece as it were, the space between objective and ocular filled in with glass. It shares with the Bruecke-Chevalier loupe the drawbacks of a small field and large lateral displacement.

If we consider the means or principles by which an enlargement of retinal images can be accomplished, we find they are

chiefly two: 1, eye and object remain in their relative positions. By interposition of an optical instrument, we cause the posterior nodal point to advance, from which advancing the enlargement results. The telescopes are representatives of this kind of enlarging the retinal images.

2, We approach the subject and take care that in spite of changed distance, clear retinal images are engendered. *The apparatus of accommodation in the human eye is the foremost example of the principle of enlargement by approaching the subject. Both kinds play a part in many of our devices for magnifying, although one of them is predominant.

By the second way, considerable enlargement can be obtained with very simple means. This was the reason why, in a number of cases with very defective vision, taking the excessively myopic



eye as a pattern, I have resorted to strong convex glasses, from 15 to 30 D, for constructing a reading glass. I will illustrate this by a case: In May, 1890, Mrs. S., a lady 59 years of age, who for a number of years had been suffering from diabetes, but, nevertheless, was active in body and mind. For three years she had not been able to read, on account of insufficient vision. The ophthalmoscope showed an old lesion at the site of the yellow spot, of typical appearance. Her vision was 3-60 in either eye; that is 1-5 of the acuteness of vision necessary to read Jaeger number 4, in ordinary distance. To enable her to read this print, the retinal images would have to be enlarged five times the size they have, when the paper is held 30 centimetres distance. This would be accomplished by holding the paper at 6 centimetres from the eye, to 10 end, an addition of 16 D to the refraction of the eye is necessary. The holding of

*The enlargement is in inverse ratio to the distance, or in direct to the approach.

a paper at such a short distance is very inconvenient, and carries with it considerable difficulties in the matter of illumination. To overcome these difficulties, I placed the lens 5 centimetres (two inches) before the eye, at the end of a short aluminum tube, blackened inside and outside, which was fastened in a spectacle frame. The distance at which the lens is placed before the eye does not change anything in the matter of enlargement, as long as the condition is fulfilled, that the object remains in the focus of the lens. Now, the type can be held at a distance of 10 centimetres (4 inches) from the eye, but the enlargement is proportionate to the shortening of the distance at which the paper is held from the lens. The other eye is excluded by a hard rubber plate, fitted into the spectacle frame, to prevent double images at this short distance. The field of vision, in such an arrangement, is considerable, and sufficient to cover several words at a time. As the glass is held in an immovable position, only the paper has to be moved past the eye, or rather, the head along the lines, which latter is more convenient. In a short time the patient had learned to use this arrangement and read, with comparative ease, her daily paper for five years. She died last year, and always felt grateful for the service rendered to her.

In the space of six years I had such glasses made * for several more patients; altogether, five. The class of patients who can be benefited by it is naturally very limited. Stationary defects of vision, arising from incurable opacities of the cornea or vitreous body, or lesions, resulting from affections of the retina, choroid and the optic nerve, may furnish suitable cases. Congenital defects of vision, or such acquired in early youth, may also be benefited, although, as a general rule, such patients have already accommodated themselves to their condition, and are frequently able to read without the help of glasses. They avail themselves of the very same principle of enlargement by approach, entirely renouncing distinctness of the retinal images in favor of their size—a proceeding which is well known to all ophthalmologists, and which goes by the name of “seeing in circles of diffusion.”

*I am indebted to Mr. Meyrowitz, for his help in constructing the little contrivance.

SOME OF THE INEFFICIENCIES OF THE METHODS
ORDINARILY EMPLOYED BY RAILWAY SUR-
GEONS FOR THE DETECTION OF SUBNOR-
MAL COLOR-PERCEPTION (COLOR-
BLINDNESS).*

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WAY COMPANY, ETC.

As illustrative of the first inefficiency, as long ago as 1855, George Wilson, of Scotland, one of the first medical men and scientists to practically study the relationship existing between imperfect color-vision and railway travel, and to actually put into use the best methods of detecting the imperfection, found as the result of numerous examples and experiments, that not only may color be recognized correctly at short distances and not distinguished at longer ones where such colors are plainly discernible to the normal-sighted, but that the sensitiveness to the colors whilst being gazed at, becomes more quickly lost as they are removed from the eye of the "color-blind," than when they are removed from the unimpaired visual organ.

To these findings he gave the somewhat graphic, yet imperfect, term, "chromic myopia," or "short-sightedness to color," which he said that, as far as he was aware, "has not hitherto been generally recognized."

Established as one of the necessities to his proposed plans of testing railway employees for imperfect color-perception, it has, in most instances, been set aside by sweeping, yet ridiculous assertions of inconvenience, impracticability, chance of imperfec-

*Paper read before the June, 1896, meeting, of the Medical Association, of the Baltimore and Ohio Railway Surgeons.

tion of examination, untrustworthiness, etc.; assertions that will apply much more forcibly to the methods that are now so universally used; loose wool-selection at one or two meters' distance.

Here, instead of the test being made at what the present writer has designated as the distances that are requisite for future safety, they are performed at so close a range to the candidate, that the results never can be depended upon as of any practical value for the safety of life and property, when such eyes are engaged in actual service upon rapidly-moving trains that follow one another in quick succession. That any previous test should be efficient, when the visual organs are placed under such circumstances, it is requisite that it should be made where they are situated, under similar conditions and whilst they are placed in the same position as they would be when it becomes necessary that they should be the sole means of exercising prompt action in the avoidance of a threatening accident or imminent disaster.

One or two meters' distance away from the point which determines the presence or the absence of a catastrophe, is, as all practical railway men know, entirely too close for the avoidance of unfortunate results during subsequent impending danger. A laden engine, moving with the rapidity of 20 to 25 meters each second, would have been propelled into destruction long before any engineer could check its speed. In other words, the recognition of the signal must be determined at a safe point; it must be made at a sufficient distance to properly control the moving mass. To do this, the visual organ which has almost sole charge of this function, must necessarily be able to differentiate color when it is placed at a safe distance; it must have been previously tested to do it at that distance; and the testing must have been done when the eyes were placed under the same conditions and under similar circumstances as when they are employed during actual work.

In the acquired color defects, produced by the introduction of toxic agents into the system, such as tobacco, and which appear in the part of the field of vision that is used when any object is gazed at, the testing with large massings of color placed at short distances from the eyes, as in the ordinary wool-tests, becomes useless; here another worse than inefficiency come into play. As the central blind or dimmed area in the field of vision does not always include the whole surface of any of the skeins of wool, the candidates may be passed, thus allowing this most dangerous class of subjects to be placed in service where they cannot differentiate the color of signal boards and lights, or even distinguish them, as in one instance seen by the writer,

where he found a case of tobacco amblyopia actually at work upon an immense railway system, after having successfully passed the near wool-test.

At about the same time that Wilson applied his findings to color-testing amongst railway employees, Lees, of the Edinburgh, Perth and Dundee Railway, pointed out another inefficiency. He stated that it was well known that the different degrees of vividity of equal areas of red and white illumination (in fact of any color) produced alterations in impressions regarding their relative distance from one another.¹ Based upon this, he asserted that "a red light seen from a distance seems much further than a colorless light side by side with it, the eye assigning a less proximity to the less luminous lamp, in conformity with its experience of the different apparent brightness of lights of the same color and luminosity placed at different distances from it."²

To remedy this in railway color-testing, both the areas of reflected and transmitted color material employed, should be graded in size and intensity of tone into proportionate amounts, thus making every color used in the tests of the same distance-value.³ That they are not, is too well known: that they should be, is an absolute certainty.

A third inefficiency in color-testing of this class of subjects, is where there is the want of consideration of the situation in which the testing is done.

The examinations should be conducted in places where the visual organs are to be employed and under the same circumstances in which they will be placed during actual work. The test should

¹This, which is just as true, though somewhat less noticeable by diffuse daylight, where the colors, as a rule, appear darker, is markedly seen when the color-hues are strengthened in brightness by being projected against the dark background of night.

²These are facts, that are well understood by painters and colorists, who make use of them in their dispositions of strongly and weakly reflecting color-areas, upon flat surfaces, in order to give effects of perspective and so-called warm and cold tone-contrasts.

The application of the rule of simultaneous contrasts to railway work may often be aggravated or even absolutely perverted when new color impressions produced by subjective after-color, as for example, as commented upon in the case of a serious collision, which occurred many years ago upon one of the Irish railways, in which it is stated that an engineer or stoker might, after gazing into the interior of a furnace box for a few moments time, see all color-signals of a greenish tinge.

³This rule is equally true for the gradation of the ordinary color signals used, not only in railway, but more particularly in marine service, where the danger is very great, especially in well filled and fog laden harbors.

be a practical one. By this means, the test-color selection in reality becomes the same as that which later is practically and almost constantly given to the visual organ. The loose-color selection must be removed to a safe distance from the candidate, and the test must be placed in the actual line of the railway track-age.

Any one knowing empirically, if not scientifically, that colors, especially red, green and blue, which are so much used in railway signalling, undergo such diverse modifications of hue when seen through varying degrees of solar luminosity,¹ can, if he be conversant with the ordinary methods of color-testing upon many of the railways, in a moment realize another source of inefficiency in the tests as usually applied.

Again, the condition of the intervening atmosphere and the dominant color of the reflecting surface near which the test is made (as for instance the green of a hillside, the grey and white of a mountain top, the blue of an ocean surface), both play important rôles in the question as to the value of the test; but as a rule, they are never considered.

The character of the illuminant itself² is of the greatest importance, and yet, how seldom until recently, in a measure in England, has it been considered. For instance, when diffuse daylight in this latitude and climate is bluish, the zirconia or metallic oxide mantel of the Welsbach light made incandescent by the admixture of air and ordinary illuminating gas, as in the commonly employed Bunsen burner, is generally known to give a greenish or nearly white tint; oils, illuminating gas and the varying shades of carbon loops made incandescent by electrical current, all emit varying degrees of yellow rays; and lastly, arcs of electricity, especially when the current is rapid and strong, even appear purplish; is it any wonder that under such varying conditions, test-colors change, not only in regard to the certain peculiarities which give them their

¹ The examples: a light red becoming purplish in diminished illumination and a vivid scarlet in increased illumination, and an impure green actually partaking of its secondary admixture upon increasing the illumination and becoming greener upon lowering the illumination, are amongst the striking illustrations that concern us here.

² We are all aware that color is markedly modified by the tint of the illuminant or the incandescent material. This fact alone gives many cases of slight imperfection in color-sense the ability to partially correct their mistakes, when color is examined under a illumination which is preponderant in yellow and orange rays.

special tones of hue, but actually, as previously shown by natural illumination, to more or less change in hue itself.¹

Consequently, when color is to be seen practically and daily under such conditions in railway employment by those who must depend almost wholly upon the perception of color alone for the safety of life and property, the testing should be done under similar conditions before any candidate is allowed to assume the risks that are incumbent upon such positions.

An inefficiency which many have tried to overcome, is the totally different values that are empirically placed upon the hue of the test-colors themselves. In England, Abney has done much towards this question by determining the value of the reds and the greens as ordinarily used under gas and electric light exposures upon some of the most important railways.

This inefficiency, however, can, and should be practically set aside, by assuming pigment-hues that are equivalent to the mid-way bands in the corresponding portions of the solar spectrum. These selections, which may be determined mathematically and analytically, by an International Commission, and then reproduced in pigment by a consensus of examination, by a sectional (or even a national) sub-committee of competent observers possessing normal color-vision,² can then be used for signal boards, signal lights and test-colors in the special locality given. The tests to be used by artificial light, or modified daylight, in different situations may, if thought wise, be constructed under the same general average stimuli that are to be employed in the future to illuminate the signal-color.

A marked inefficiency in all color-testing amongst railway employees, is the permittance of candidates with slight, though recognizable, imperfect color-vision, to pass the examination and afterwards to occupy positions where a part of their daily duty consists in differentiation of color.

¹ For example, a definite area of red hue at a fixed point, will with varying tints of some form of dominating colored lights (especially if the substance reflecting or transmitting the red be made interchangeable in construction), affect certain peculiarities in coloration before the last phase of the color itself is annihilated: so with every other color differentiation.

² Of course, a series of International Appeal Pigment-tests could be obtained and used as checks, by the International Commission, but, as the sectional tests would most certainly represent the preponderant ratios of color in the locality in which the tests are to be employed and the signals to be used, it would seem to the writer that the plan described above, is for the present, the more practical of the two.

There should not be any degree of standard in regard to the capacity and responsibility where color differentiation forms itself as a part of the routine duty of the employes. Such positions are so few in number, when contrasted with the great supply of available applicants, and the responsibility is so grave, that no exception should be made. By this means, and by no other, will the chance of danger of admission of imperfect color seeing organs into actual service can be further reduced to a minimum.¹

Again, in this connection, it must be remembered that in reality the employee is the one who is the most protected. He necessarily is the one that in an accident runs the greatest risk of forfeiting his life. Such candidates should be rejected without a particle of sentiment. They should not be accepted if they are practically unfit, even to a minor degree, for the work required of them in color-perception.²

The lack of systematic and periodic re-examination of those who have been previously accepted, is another great evil. This inefficiency in color-testing amongst railway employees, is reprehensible. It is not expecting too much that the tests employed in different seasons upon the entire personnel of the railway company, that is engaged in positions where recognition of color in any important way, affecting life and property, is at all necessary. After every case of severe injury or attack of illness that might in any way be likely to produce visual disturbance, the examination should be made. Amongst those who are known by strict, and yet silent surveillance, to use any toxic agents, such as tobacco and alcohol, the tests should be both painstakingly and frequently tried.

The increased responsibility acquired by civil service, where older subjects who are more prone to exhibit acquired color-defects than younger ones, and who are necessarily given positions that more greatly necessitate the employment of normal color organs than even before in the past, has not been considered as fully as it should be. In every such case there is sufficient reason to require careful periodic repetitions of some of the most important of the means that are employed to re-study color conditions.

¹ Just as in parental countries, unremitting quarantine inspection, compulsory vaccination, etc., are the only ways to guard against danger. So here the barrier should be placed at the entrance and no one who does not possess a normal color-sense should be admitted.

² The fact that the differential diagnosis between a fixed congenital malformation and a commencing acquired color-defect in many cases, is at times, extremely difficult to determine, by an Ophthalmic Expert with his instruments of precision and his many methods of careful clinical research, renders this more pertinent.

That these general inefficiencies, so often seen in color-testing—a few amongst many of both greater and lesser importance—are still permitted, is beyond comprehension. At first sight most of them appear of minor importance to railway surgeons, the general practitioner of medicine, the railway official and the layman, yet without citing any of the well-known catastrophes, both by land and sea, that have, without question, been proven to have been dependent upon imperfect color-vision in unexamined and faultily examined employees, it must be conceded by all, that the subject, when more fully understood and better realized, becomes of vital interest. Moreover, when it is considered that between four and five in every one hundred healthy men possess degrees of congenital sub-normal color-perception that practically unfit them for employment in this peculiar direction (dangerous work that is mainly dependent upon color-vision), it seems to the writer's mind, at least, that there should not be an iota of quibble as to the advisability of the most careful and the most conscientious selection of only those candidates who possess as one of the most important parts of their physical equipment, a normal color-vision in each eye.

Green and red colors, in spite of all attempts of abandonment or change, must be used for railway signalling (and hence testing), and as these colors are the ones that are unrecognized by the great majority of the congenital cases of lowered color-perception, and are those that disappear the earliest in incipient diseases, the danger must constantly remain with us. Increased illumination of signals by electricity will not remove the cause. All that can be done is to have an uniform coloration of all colors used, both in regard to hue and tone, subject to the average varying conditions, situations and circumstances in which the signals are to be employed throughout the entire railway system of any certain geographical section; and to perform the tests under the same conditions as the candidate is to be placed when it becomes necessary for him to determine quickly and promptly the colors of the signals in actual use. The signal-colors fixed and certain, nothing further remains necessary but to make the test-colors as nearly as possible identical with them.

Knowing from experience that loose color-selection, at a distance, is the only way to accomplish the purpose properly, simply and quickly, by those who are adequately trained in its performance, some such plan as shown and described by the writer in a paper read before the 1888 meeting of the American Ophthalmological Society, can be used as the general method. By

this means, the numerous other and more complex plans can be reserved for a Chief Ophthalmic Expert of the road, and his Assistants. To them, all doubtful cases, and those where medico-legal questions may arise, can be given, so that less error in reasoning and fewer flaws in judgment can be established in any given case.

In conclusion, it must be understood that the present paper is merely an effort to supplement what the writer has time and again personally endeavored to accomplish in other ways; that is, to protect the travelling public and their property from one of the greatest of special dangers known in railway service: subnormal color-perception (so-called "color-blindness").¹

¹ All that has been written here, is equally as true for the so-called traction trolleys which run at such high rates of speed, especially in the suburban districts, and so rapidly and frequently change passengers. For this class of employees, as a rule, applicants are selected for duty as both motormen and conductors, with an utter disregard, not only as to their color-vision, but, as to their other visual functions.

THE MANAGEMENT OF GLAUCOMA; CHRONIC
SIMPLE GLAUCOMA (CHRONIC INTERSTI-
TIAL OPHTHALMITIS).*

BY STEPHEN OLIN RICHEY, M. D.,

WASHINGTON, D. C.

After the many decades of unsuccessful surgical interference in this class of cases, the above title may excite little interest, as many clinicians of experience are skeptical of good results; a skepticism founded upon the results of surgery. Why should we expect to cure a local expression of a general dyscrasia, by local operative interference, to which nothing is added, because we have labored in the dark, ignorant of the cause and nature of the disease, whose local pathological changes are of low grade, slowly and insidiously progressive? Operation does not modify the cause; it serves only to gain time, in some cases, until such modification can be secured; or, to recover functional integrity, the cause being controlled.

From the date of Graefe's observation that loss of vision in acute glaucoma, was often prevented by iridectomy, this practice has been empirically continued. A symptom, increased intra-ocular tension, has been accepted as the *corpus et spiritus morbi*, and all study and every remedial measure has been addressed to this feature; a mistake which has fostered the practice of iridectomy in simple glaucoma; has substituted for it anterior, or posterior sclerotomy, or stretching of the supra-orbital, or the external nasal nerve. The same untoward fate has attended all forms of operation in this affection; all local means having been tried, it has been a common practice, unpleasant to dwell upon, to desert the case without further effort. Any one of the opera-

*Read before the American Ophthalmological Society at New London, July 16, 1896.

tions named may temporarily relieve high intra-ocular tension in one case, and the next case may be worse for it. High intra-ocular tension may be reduced without influence upon the visual power, or the advance of the disease, for the affection progresses in some cases without demonstrable increase of tension.

The above considerations, and many others, but chiefly that in recommending to a glaucomatous person an iridectomy, I could not assure him of a probable outcome, but had to say, "The operation is classical, and is the best measure known to the science," induced me to enter upon a study¹ of the affection, laying aside my acquired views as long ago as 1884. It may be well to state here that I have never seen a case of glaucoma, acute or chronic, that did not have a history of gout, inherited or acquired; or show, sooner or later, the ordinary symptoms or developments of gout, except a few cases caused by syphilis; the cause in such cases being clearly indicated by the history. Further, in my experience, the eye affection may be more satisfactorily managed by the best measures employed in handling gout, than in any other way; provided, always, that the acute form is seen before the loss of visual power is so imminent as to require immediate interference to relieve pressure symptoms. An acute attack of glaucoma may occur, and there may never be another, even if iridectomy be not done.

Whatever details of treatment are adopted, it is possible to lay down certain broad propositions by which, as a guide, the constitutional vice may be influenced. I have never seen acute glaucoma from syphilis, and think it does not occur.

First. When syphilis is the agent of causation, the indications are clear; anti-syphilitic treatment.

Second. Acute or chronic glaucoma of other origin, finds its initial cause and beginning in the digestive tract.

Third. A departure from the normal physiological processes in the digestive tract intoxicates slowly, progressively, and ac-

¹ To aid the brevity of this communication, reference is made to my papers on this subject, that the interested may follow the course of reaching the conclusion that chronic, simple glaucoma is a chronic interstitial ophthalmitis, generally of gouty origin. They are:

The Prime Etiological Factor of Glaucoma, is Constitutional (Trans. Am. Ophthl. Soc.; Vol. VI, part 2nd, p. 283, 1892.)

The Disease Process, Glaucoma (Am. Jour., Med. Sci., June, 1893.)

The Halo Symptom in Glaucoma (Trans. Am. Ophl. Soc., 1894, and Annals of Ophth., and Otology, July, 1894.)

Chronic Interstitial Ophthalmitis (Chr. Simp. Glaucoma) (Annals of Ophth. and Otology, July, 1895.)

cumulatively, both the vascular¹ and the nervous systems, producing a degrading tissue change in various organs; an interstitial ophthalmitis, an interstitial nephritis, or an interstitial hepatitis; one, or all, of a chronic and progressive character, which may advance slowly or rapidly, or be precipitated into a violently active form by injury, exposure, a more than usually indiscreet meal, or by a severe emotional crisis.

Fourth. That chronic simple glaucoma consists in a hyperplasia of connective tissue, involving ultimately the whole bulb, and cannot be cured by operation.

Fifth. That the acute form is vascular in character, and may be engrafted upon the chronic form in its earlier stages, being thus modified into what is called "irritable" glaucoma.²

Sixth. That to meet the indications on this basis, we must begin with the beginning of the disease and correct individual habits, while obviating the danger arising within our special jurisdiction; not simply to operate and neglect further precautions. The application of such precautions require more than special knowledge, as we use the term.

In a paper read before the American Ophthalmological Society in 1892, claiming glaucoma to be gout of the eye, reference was made to the kind influence of clothing, exercise, regulated diet, galvanism, arsenic, lithium, and salicylic acid, in the form of salol, as measures of constitutional importance in chronic glaucoma. In an affection of so much complexity and difficulty, of such great chronicity, and such unreliability in responsiveness to measures which are wholly within the caprices of the patient, it was impossible to be sanguine, even if the results had been better than those usually secured by other means. The added experience and observation of four years have convinced me of the accuracy of the views then advanced, though the means have been somewhat modified by the additional experience, and made more exact, as follows:

As to the local treatment, it is based upon the hypothesis of intra-ocular venous stasis as the cause of increased intra-ocular tension, and consists in the use of a collyrium of eserine, varying in strength from 1-4000 to 1-1000, in one drop doses, repeated as

¹ By auto-intoxication, the nervous system, through the blood channels, with reaction upon the vascular system, by means of the vaso-motor nerves.

² Haemorrhagic glaucoma, is differentiated by vessel coats too rotten to sustain the increased arterial tension. In such cases death usually comes by intra-cranial haemorrhagic effusion from the same cause.

often as is necessary, at short intervals, to contract the pupil, if it is possible for it to do so. If eserine proves irritating, pilocarpine may be substituted. Advancement of the lens and iris, and dilatation of the pupils in glaucoma, are caused by the great fullness of the intra-ocular venous system, and the myotic acts by its effort to empty the veins by pressure from in front. When this turgidness is not reduced the pupil fails to contract, and an increase in the strength of the collyrium only causes violence and danger of iritis, without compensating efficiency. A drop, every ten or twenty minutes, of the strength named maintains safely all the possible influence of the myotic, even if the pupil does not contract. While continuing its use, light taxis of the bulb through the closed lids, over the cornea and ciliary region, if the eyeball is not too tender, with the palmar surface of the two index, or the two index and middle fingers, should be practiced. The pressure should be light and alternating in character. It aids the contractile action of the pupillary muscular fibres, empties the swollen veins of the fundus, and restores the iris and lens to their normal position. The pupillary nerve filaments recover their tone, of which pressure had deprived them; the pupil recovers its size, and tension is reduced.

By this system of taxis, without other mediation, I have reduced tension. In chronic glaucoma, not responding in the slightest degree to eserine, I have found tension lowered, and the pupil contracted, under gentle taxis for ten minutes, even less. When tension has been reduced, the pupil contracted, and the iris replaced, this condition may be maintained by the myotic used with decreasing frequency, aided, if necessary, by daily taxis. The myotic alone has maintained this condition for weeks, used twice a day in the strength of 1-8000, and in chronic glaucoma. If high tension is incorrigible to these measures, the local abstraction of blood by leeches may serve a good purpose, as it did for me once, in a gouty patient with contracting kidneys, who was confined to bed, and had an acute exacerbation of a chronic glaucoma, with severe headache; result, lowered tension, headache relieved, pupils contracted readily to eserine 1 to 8000, which they had refused to do before.

Nothing more than a reference to the effect of topical heat is necessary here, as we are all familiar with it.

The question of constitutional agents is most important; but exercise, clothing, diet, and galvanism, will not be considered, as they require too much time.

Habitual high arterial tension and glaucoma are found associated; though arterial tension exists without glaucoma, the latter seems to depend upon the former, for high arterial tension precedes and co-exists with glaucoma. Hence, the suggestion of the general hot bath (105° to 108°). The habit of over-eating, of eating in excess of the requirements of the system, or beyond the powers of digestion and assimilation, results in the collection in the blood-current of irritating material; the coats of the blood-vessels, especially of the peripheral small vessels, being irritated thereby, contract and resist the passage of the blood-current, thus increasing the action of the heart; the cranial vessels, having the least contractile power, permit an excessive volume of blood to reach this region.

Nitro-glycerine and nitrite of amyl are the two most efficient and prompt drugs within our knowledge for the reduction of arterial tension; alike in their mode of action and in their effect upon the system. Both reduce tension by their influence upon the great vasomotor centre in the medulla oblongata, causing paralysis of this area, with consequent inertia of the vaso-constrictors and dilatation of the blood-vessels, beginning with the nearest, those of the head and neck, producing headache, nausea and languor. An over effect may result in death in this way from paralysis of the muscles of the heart and respiration—the involuntary muscles. Another danger is to be found in idiosyncrasy, as some persons are intoxicated by minute doses. They are incapable of sustained effect, as this depends upon the paralysis of the dominating vaso-motor centre, which can not be continued. Nitro-glycerine (and probably amyl) seems at times to produce toleration of rational dosage; and moreover, both in their mode of action begin at the nerve centre, while the cause of general arterial tension works at the periphery.

A natural and safe agent, capable of sustained effect, is to be found in the hot bath, which dilates the superficial vessels, and contracts the cerebral vessels by indirection; the dilatation of the superficial arterials lowers general arterial tension, lessens the local volume of blood by diversion to the surface, and reduces the whole volume by the transudation of its watery constituents through the skin. It is valuable in the emergency of acute glaucoma, and as a habit in chronic glaucoma. It partly removes the cause, and, like iridectomy in acute glaucoma, it palliates the expression. The cold still bath in glaucoma is suicidal.

Prior to 1892, I had relied upon salol in these cases, under the impression that it offended the stomach less than other sal-

icylates, and because the phenol of the combination is an intestinal antiseptic. A combination of salicylate of sodium, in proper dosage, is as well tolerated and more effective. The salicylates lower the heart's action, but do not at the same time reduce arterial tension; hence their danger.

Ammonia, which is a volatile alkali, and renders any other unnecessary, and is also a solvent of the alleged toxic agent, enters into the combination with salicylate of sodium.

Ammonia is a normal constituent of the blood, helping to maintain its fluidity by holding the fibrin in solution (Bartholow). It increases the temperature of the extremities by lowering arterial tension, relieving the labor and consequent excitability of the heart, and thus promoting the permanency of the effect of the hot bath. It keeps the haemin crystals in solution, and probably leaves the stomach as the less volatile chloride by combination with the gastric hydrochloric acid. Hot pediluvia and muriate of ammonia fomentations are said to have cured senile gangrene. Observation leads me to the opinion that the growing prevalence of lithaemia may be due to the reduced ingestion of ammonia with our food, from which (being volatile) it is probably driven off by the cooking. Every other alkali is wanting in the diffusible, indirect, stimulating effect of ammonia. It renders the salicylate of sodium safer by reducing arterial tension, as the salicylate lowers the action of the heart.

Taraxacum, a mild hepatic stimulant, is the third ingredient.

This combination is an efficient form in which to secure the best effects of all the constituents, and I have seen the peculiar pallor of the gouty and glaucomatous individuals promptly replaced by the health tone, under its influence.

Colchicine:

Colchicum is an old remedy, which has its virtues, and colchicine, the active principle, is the most convenient form in which it can be used. Like every other form of colchicum, it has a marked influence upon the digestive tract, causing diarrhoea, and must be given with caution. It is sedative to the nervous and vascular systems, sometimes increasing, and at other times diminishing, the irritability of the stomach. Acute glaucoma seems to be most susceptible to its influence; at times being promptly aborted by it. In other cases, it seems to be without effect, and so far, I have been unable to distinguish the cases, except by trial. It has most promptly improved the worst cases of serous iritis I have seen, and when they were amenable to nothing else.

Its peculiar action in gout has never been explained satisfactorily, but it seems to be selective in its action, and individual idiosyncrasies exist. I have used it cautiously in doses of gr. 1-100 to gr. 1-50, three or four times a day, guided by the more or less intestinal irritation produced. The chronicity of simple glaucoma limits its usefulness in such cases to the exacerbations.

To recapitulate:

In acute glaucoma, the general hot bath, the use of the myotic with taxis, exhibiting colchicine promptly; repeat the hot bath after several hours, if necessary, always keeping the patient warm after it. The employment of such means, while waiting to determine the necessity for an operation, will often obviate iridectomy. After gaining control of the attack, prophylaxis, as in the management of chronic simple glaucoma. In chronic glaucoma, a bath should never be taken except in hot water, and this should be a resort several times a week. Sponge baths should be interdicted; always tub-baths, immersing the whole body, for the reason given above, and in a warm room. The bath need not be so hot (102° to 104°), nor continued long enough to produce sweating. A weak collyrium of the myotic should be persisted with, aided by daily taxis for a few minutes, until tension is normal, and remains so. At intervals, taxis must be repeated for a few days.

The mixture of salicylate of sodium, ammonia, and taraxacum, should be pushed to the point of the physiological tinnitus, and be continued at this as long as necessary, combatting any symptoms of irritable glaucoma which may arise with colchicine, if it acts well, suspending the mixture while doing so. The intestinal tract must be soaked out with hunyadi janos; this favors intestinal digestion. Three or four ounces of the water should be taken at bed-time, not standing upon the feet afterwards; and this should be repeated every night, perhaps in less quantity, until the stools become yellow. It should be used in this way once a week, or fortnight.

Other indications should be met as they arise, by calomel, gr. 1 in divided doses, for hepatic inaction; tinct. nucis vom., as a stomach tonic; Fowler's solution of arsenic, as a preservative of food in tardy digestion, drop doses at meal time in the soup, or a cup of fluid.

Cases have been under my observation for ten and twelve years in which the halo-symptom has been persistent, the refraction has increased, and the excavation of the disc has steadily

deepened, but there has been little loss of acuteness of vision, and no persistent contraction of the field. The contraction of the field has been always associated with temporary increase of tension, easily reduced.

In acquired glaucoma the outlook is more favorable, and attention to diet, and the method of eating, will probably cure. In case of an inherited tendency, the whole plan of living requires supervision to preserve vision. This is modified to suit the individual case, and is too elaborate for consideration here. Such cases are never cured, I fear.

THE USE OF THE ELECTRO-MAGNET IN OPHTHALMIC SURGERY, WITH SOME ILLUSTRATIVE CASES.*

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Since the electro-magnet has come into use in ophthalmic practice, we have a ready means of removing many foreign bodies from the interior of the eye, which would otherwise baffle surgical intervention and ultimately destroy the vision of one or both eyes. I do not mean to say that every piece of steel or iron can be removed from the interior of the eye by means of the electro-magnet, or that when removed the eye will always make a good recovery; but of this I am certain, viz.: that with proper appliances, many eyes can now be saved which formerly would inevitably have been lost.

I have had no opportunity of using the large magnet of Haab, but can readily believe it might have a larger sphere of usefulness than the small magnet I have been in the habit of using for some years. This instrument is the Bradford magnet, and is fairly powerful in its action, since we have the means of attaching it to the electric lighting current. This is done by means of a somewhat formidable dynamo transformer of the constant current used in the Hospital for lighting. The magnet is thus rendered much stronger and more reliable in its action than it used to be when attached to a Grenet battery cell.

I may say, to begin with, I have never yet been fortunate enough to extract a foreign body from the eye which I could not accurately locate before operating. But, on the other hand, I never failed to extract any fragment of iron or steel which I could see before making the attempt to remove it. I would infer from

*Read before the Canadian Medical Association in Montreal, on the 27th August, 1896.

this that the point of the magnet must be brought very near to, or in actual contact with, the foreign body before it will exert sufficient magnetic attraction to withdraw it from the eye. If this be true, it is easy to understand why the chances of success are but slight when the exact position of the foreign body is unknown.

Small particles of metal which have not passed beyond the iris, or lens, can often be seen by the naked eye, or with the aid of focal illumination, but those which have entered the vitreous chamber can only be seen with the ophthalmoscope.

There is one practical point which I wish to emphasize, namely: the sooner an expert examination can be made after the accident, the better will be the chance of making an accurate diagnosis. The transparent media of the eye are likely to become clouded, more or less rapidly, after such accidents, and a delay of some hours or days, may make all the difference between success and failure.

I believe that a large majority of injuries to the eye occurring amongst metal workers are inflicted by quite small fragments of steel chipped from the edge of hammer or chisel. These commonly vary from two to four millimetres in length, and are much less in breadth and thickness. Larger fragments, from a quarter to half an inch or more in length, are mostly derived from the metal being wrought upon. Such larger masses, when they penetrate into the interior of the eye, often inflict such extensive injury that the eye is obviously destroyed, whether the fragment can be removed or not. It is, therefore, the injury caused by small fragments which chiefly concerns us in our efforts to save the eye from destruction. Foreign bodies, such as these, when they pass through the lens, do not usually cause much, if any, bleeding into the eye, and for some time afterwards the lens and vitreous may remain sufficiently clear to admit of an efficient ophthalmoscopic examination, which will often suffice to locate the intruder, and thus render its extraction an easy task, if it consists of iron or steel.

Fragments which penetrate through the sclerotic, are apt to occasion more or less abundant extravasation of blood in the vitreous (a very important diagnostic point, if the external wound be very small, since a small particle merely wounding the sclerotic would not cause intra-ocular hemorrhage); but even then, the ophthalmoscope will sometimes discover the position of the foreign body and the magnet itself may be used to confirm the diagnosis, as in Case V.

The introduction of the small magnet point into the vitreous chamber does not, with proper care, seem to be followed by injurious inflammatory reaction, and although augmentation of existing opacity in the vitreous may follow its use, this soon clears up if there has been no septic infection.

The operation. Whenever a fragment of metal, such as can be attracted by the magnet, is discovered in the eye, we have to consider the best means of reaching it. The cases I now report are typical, showing, as they do, what may be done in three classes of injury.

- (a) Where the foreign body is in the anterior chamber.
- (b) Where the foreign body is still engaged in the sclerotic, though mostly within the eye.
- (c) Where the foreign body is lodged in the vitreous chamber.

Case I. A healthy man, about 50 years of age, was struck in the eye by a piece of metal while standing near a blacksmith's forge. Two days later he came to hospital with the eye very much inflamed and painful, the aqueous cloudy, the iris turbid and vision reduced to counting fingers at four feet, tension=1+. There was a small wound in the cornea, near its lower and external margin. The lens showed no sign of injury, though the pupil dilated moderately with atropine. At the outer periphery the iris presented a localized swelling, in the midst of which a small, dark mass was dimly seen. The excessive reaction in the iris from so small a wound was sufficient ground for the belief that this must be the foreign body in the eye.

The eye was thoroughly cleansed, and washed with perchloride solution, 1 in 5,000, and then rendered anaesthetic by repeated instillations of a 4 per cent solution of cocaine; an incision was now made as for an iridectomy, at the outer corneal margin. As soon as the point of the magnet was placed in contact with the incision, a piece of metal about 3 mm. in length sprang out of the chamber with the utmost alacrity. In a few days the eye made a perfect recovery.

Case II. A man accustomed to do odd jobs about the house was removing an iron hoop from a barrel, with a hammer and chisel, when something struck him in the eye. Shortly afterwards, his family physician found a foreign body imbedded in the sclerotic, near the outer margin of the cornea, but failed to extract it, after prolonged manipulation. Two days later, the eye having become inflamed and very painful, he sent the man to me.

I attempted to remove the fragment with a curved needle and with fine forceps, but signally failed, and sent him to the hospital. Here, the magnet instantly removed a spiculi of metal about 4 m. m. in length, 3 m. m. of which must have projected into the interior of the eye.

Case III. A healthy young Swedish iron worker came to my office on account of some dimness of vision, five days after a slight injury.

There was evidence of a very small wound in the sclerotic, now healed, about 6 m. m. from the lower and inner margin of the cornea. Vision 6/12. With the ophthalmoscope I discovered a small, bright scale of metal, floating as nearly as possible in the center of

the vitreous. Having sterilized and cocaineized the eye in the usual way, I detached the conjunctiva over a small area at the seat of injury, and made a meridional incision about 6 m. m. in length, then, fixing the eye with forceps held in one hand, while my colleague, Dr. Birkett, kept the foreign body in view with the ophthalmoscope, with the other hand I passed the point of the magnet towards the fragment. Presently, Dr. Birkett said: "You have it;" and, sure enough, I had. In a short time the eye entirely recovered.

Case IV. A blacksmith was sent to me about a week after an injury which had seemed trivial at first, but soon caused great dimness of vision, with dark objects floating before the eye.

I found a small wound in the lower part of the cornea, a corresponding rent in the iris, an opaque streak through the lower part of the lens, and a good deal of cloudiness in the vitreous, in which I also discovered a shining fragment of metal. After raising a small flap of conjunctiva between the internal and inferior rectus, I made a meridional incision through the sclerotic, passed the point of the magnet about half an inch into the vitreous, and removed the piece of steel without difficulty.

The eye recovered promptly, though vision remained defective, on account of an increasing opacity of the lens, caused by the passage of the fragment through its substance.

Case V. This was very similar to the last, except that there was rather more opacity of both lens and vitreous. Among the movable opacities in the vitreous, I discovered one especially dense, and suspecting it might contain the foreign body, I applied the magnet to the sclerotic. With each closure of the electric current, this darker opacity could, with the ophthalmoscope, be readily seen to make a distinct movement towards the magnet and sink down again when the current was opened. This was proof positive that the opacity contained the piece of steel. A similar procedure to that in case IV, resulted in its immediate extraction.

Here, too, recovery ensued with no other complication than the increasing lenticular opacity, such as we nearly always see after even slight wounds of the lens.

Case VI. The last case upon which I operated, was one in which I could not locate the fragment of metal, though the history made it probable that the foreign body consisted of iron or steel.

The wound occurred while the young man was working with hammer and chisel, on the interior of an old boiler, and the scleral wound though small, was attended with a good deal of blood extravasation in the vitreous. The operation failed to remove the foreign substance, and the eye, having become sightless, soft, and very sensitive, I performed the "Mules" operation last Saturday.

The foreign body, which you see here, appears to be a hard compound of silica lime and carbon, coated on one side with the oxide of iron, and it is only slightly amenable to magnetic attraction. This was very likely the reason why the operation failed to remove it.

This result does not score against the usefulness of the magnet in suitable cases, but is an apt illustration of the difficulty in making an accurate diagnosis, not as to the presence of the foreign body, but as to its nature.

In testing the attracting power of the magnet on small fragments of steel in vitreous humor and water, respectively, I always found that the attraction was exerted through a greater distance in the former than in the latter. I do not know the explanation of this, to me, unexpected phenomenon.

A CASE OF PECULIAR CONGENITAL GROWTH AT THE INNER CANTHUS.*

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ILLUSTRATED.

In March, 1888, I was called by the family physician, Dr. R. L. Banta, to see Walter G., a child about three months old, who was born with a growth projecting from the inner canthus of the right eye. This growth was round, semi-solid, non-fluctuating, and was covered with normal skin. It was about an inch in diameter, and had a large pedicle, about one-third of an inch in diameter. By this it was attached to the inner extremity of the edge of the lower lid, to the inner canthus and skin over the lachrymal sac, nearly up to the inner extremity of the upper lid, but not fully reaching it. It supplanted the caruncle and was adherent to the inner and lower part of the eyeball, its covering extending nearly to the center of the cornea. On the eyeball this dermal covering was so changed as to resemble, somewhat, mucous membrane in its smoothness, but was opaque and whitish in color. The upper lachrymal punctum and canal were preserved, but the lower were entirely absent. The lachrymal secretion seemed to find free exit as in normal eyes. The growth was quite movable, and did not materially restrict the movements of the ball.

Figure 1 shows the general appearance and situation of the growth.

On March 28, 1888, assisted by Dr. Banta and Dr. W. B. Davis, of the U. S. Army, I removed the growth by first forming a flap above, about one-half inch in length and nearly the same in width, with its base attached to the eyeball at the lower and inner

* Read at the American Ophthalmological Society, New London, Conn., July 15, 1896.

margin of the cornea. A similar flap was next taken from the lower surface of the growth. Then I proceeded to dissect the pedicle from its attachments to the eyeball, carefully avoiding the ocular muscles, and from the inner part of the orbit. During this dissection, I was greatly surprised to find a bone-formation in its orbital extremity. This extended backwards into the orbit towards the inner wall, to which it seemed to be attached at its end. Its anterior extremity was freely movable around this point of attachment. After the removal of this piece of bone, which was easily done, I completed the extirpation of



Fig. 1.

the remainder of the growth, leaving no part of it behind, so far as I could see, except the flaps of skin. As soon as the hemorrhage, which was slight, had ceased, I retroverted the lower flap and carried its edge, with that of the upper eye-ball flap, by means of suitably placed sutures down into the lower retro-tarsal space, and fixed both of them in this position, by passing the sutures downwards beneath the skin of the cheek for half an inch, and then bringing them outside and tying them. The flaps healed in this position, and ultimately the appearance was that of a dense leucoma of the lower and inner part of the cornea, a cicatricial covering of the corresponding portion of the eye-

ball, and a cicatricial-looking edge of the lower lid at its inner third, and an absence, of course, here of the cilia. The upper and outer two-thirds of the pupil were exposed to view and the movements of the eye-ball were unrestricted and normal.

The final appearances are well shown in figure 2.

Examination of the growth showed that its principal mass was entirely composed of adipose tissue, covered with skin, normal both in color and to the sense of touch, excepting where it was reflected onto the eye-ball. Here it partook more of the char-



Fig. 2.

acter of mucous membrane, though thicker, whiter, and more opaque.

The bone-formation, which extended from the pedicle into the orbit, was flattened and about three-fourths of an inch long, being one-sixth by one-eighth of an inch in its largest diameters, and was somewhat pointed at its posterior extremity.

I present this case as unique. I have not been able to find in medical literature anything in the least resembling it. It is peculiar in its location, in its perfectly rounded form, in its being composed of compact adipose tissue, in its peduncular extremity containing a bone-formation, and in the entire absence of a cystic character.

LENSES FOR THE BINOCULAR EXAMINATION
OF THE EYE BY OBLIQUE ILLUMINATION.

BY EDWARD JACKSON, A. M., M. D.,

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ILLUSTRATED.

The history of ophthalmoscopy gives one of the best illustrations of what is possible of attainment by monocular vision, and also of the difficulties of such attainment. The wonderful refinements of ophthalmoscopic diagnosis have been reached through monocular vision. The "binocular ophthalmoscope" gives a very imperfect binocular vision and has contributed little to our knowledge of ophthalmoscopy. Yet with the ophthalmoscope, for a definite impression of relative depth, we have to resort to the measurement of refraction, or the parallax. The earlier discussions as to whether the optic nerve entrance usually presents a cup or a papilla, and the debate, probably not yet concluded, as to the cause of the light-streak on the retinal vessels, illustrate the slow and difficult process by which our present knowledge of the ocular fundus has been attained.

This slow and difficult process has still to be repeated in the experience of each young ophthalmoscopist. Supplemented by accurate descriptions and the minute knowledge of the anatomy of the parts, much experience is required to recognize readily and promptly the exact nature of the more common conditions revealed with the ophthalmoscope. When new and unfamiliar appearances are encountered in the ophthalmoscopic image, only by prolonged and repeated studies, with careful consideration of collateral symptoms and evidence, can the most expert ophthalmoscopist gain an appreciation of their significance.

The same difficulty of appreciating what is seen occurs in the study of the appearances of the anterior segment of the eye-ball

as they are brought out by oblique illumination, when this study is undertaken with the aid of a monocular magnifier—the corneal loupe. The difficulty is not merely the difficulty encountered in using a single eye, without a lens. All optical instruments which magnify the object looked at in the plane perpendicular to the visual axis diminish the amount of light received on a given portion of the retina, and hence the vividness of the impression made; and failing to produce any enlargement in the direction of the visual axis, they cause a distortion of the image formed, which renders it positively more difficult to judge of the relative distance or “depth” of the parts seen than it is to judge of such depth with the single naked eye.

This difficulty may be perceived with the telescope, or the compound microscope, as well as with the simple microscope. In the “binocular compound microscope,” as in the “binocular ophthalmoscope,” an attempt has been made to get over this defect. But, as has already been indicated as to the latter, the success attained has been imperfect and the practical usefulness of the instrument slight.

There is a good reason for this in the general plan employed in these instruments. The pencils of rays for the two eyes are obtained by dividing the single circular pencil of rays passing through an object glass, into two semi-circular pencils. In each of these semi-circular pencils, the extreme rays at the angles of the semi-circle originally diverge in the direction perpendicular to the visual plane (a plane passed through the two visual axes) as much as do the extreme rays of the two pencils diverge in the direction of the visual plane. The images formed in the two eyes in ordinary binocular vision are formed by small isolated pencils of rays, divergent only in the visual plane, or divergent in that plane by the width between the pupils while they diverge above and below it, only by the semi-diameter of the pupils. But the images formed in either eye through the “binocular” ophthalmoscope or compound microscope are formed by pencils that diverge for each eye as much above and below the visual plane as they do for the two eyes in that plane. They are, therefore, images having to a very slight degree the characters of ordinary binocular images, but composed of rays so divergent in entirely different directions that the visual centres accustomed to the ordinary problems of binocular vision are quite unable to appreciate them. Such images give a sense of indefiniteness and unreality that robs them of practical value. The conditions of true binocular vision are such that the two eyes receive small

pencils of rays, the two pencils having sufficient divergence from one another to give slightly different images, but the rays of each pencil being sufficiently near parallel to allow of their forming a definite retinal image. These conditions are fulfilled when the pencils of light employed are limited only by the pupils, as they are in the instruments here proposed.

The advantages of binocular vision for the examination of the anterior segment of the eye by oblique illumination have always been, to some extent, appreciated. Many surgeons have not habitually used the corneal loupe. Some with high myopia and strong convergence depend on their unaided eyes; others use strong convex lenses before both eyes, sometimes combined with prisms; others still use something like a reading glass, large enough to allow both eyes to look through it at once. But none of these arrangements give a sufficiently high magnifying power. About two or three diameters, estimated by the ordinary standard for the microscope, is all the magnification that can be secured by any of these plans. In contrast with them the lenses now to be suggested are easily capable of giving an enlargement of eight to fifteen diameters, measured by the same standard, as much as is attainable with a good corneal loupe.

The obstacles to binocular vision with the ordinary lens, or simple microscope, are these: The divergence from each other of the pencils of rays going to the two eyes is necessarily so great, that these pencils fall so obliquely and so far toward the periphery of the ordinary magnifying lens, that they are too much distorted to be useful for purposes of accurate vision. Only by bringing the lens so close to the object as to sacrifice most of its magnifying power can binocular vision be obtained through it.

To overcome this obstacle, it is necessary to divide the lens into two portions, each of which shall have its separate optical centre, and shall be placed with its refracting surfaces approximately perpendicular to the rays passing through it. To lessen the need for unpleasantly strong convergence, when trying to secure binocular vision at so short a distance, it is also needful to secure in some way a considerable prismatic effect.

The first, and in some ways the simplest apparatus for meeting these requirements, is the double lens, described by the writer in the *Ophthalmic Review* for May, 1896. It consists of two plano-convex lenses, so joined that their plane surfaces make with each other an angle of from twenty to thirty degrees, the optical centres of the two portions being from two to six

millimetres on either side of the line of junction, farther for a weak lens and closer for a strong one. Such a lens may be made by cementing together two separately ground lenses. But Messrs. Wall & Ochs, who make these lenses for me, have succeeded in grinding them from a single piece of glass, the one surface being spherical convex, and the other surface consisting of two planes meeting each other at a proper angle. Theoretically it is impossible to make the junction of these planes a perfectly sharp, true angle; yet it has been made true enough for all practical purposes; and the lens made of one piece of glass is free from the inconvenient liability of the two cemented halves to separate.

The learning to use such a lens is, however, attended with some little difficulty, especially to one who is accustomed to the examination of the anterior segment of the eye with the monocular magnifier. Even with careful placing of the binocular lens so that no unequal vertical prismatic effect shall be caused, and so that the two halves of the lens are properly before the observer's eyes, there remains a tendency to regard the doubled image seen through the two halves of the lens with one eye, and to disregard all the impressions made on the other eye, instead of regarding the images received in both eyes through their respective halves of the lens, and fusing them to binocular vision. This difficulty is met by any device which shuts off each eye from the part of the lens belonging to its fellow eye, as in the instrument here shown and described.

This later instrument, as compared with the binocular lens just described, also allows of a slightly greater reduction of aberration by the appropriate curves on both surfaces of the lens, and some saving of effort of convergence by the position of the prisms close to the observer's eyes. Still to one who has learned to use the simple lens, these advantages do not more than compensate for the increased bulk of the later instrument.

The later form of instrument, a diagram of which is here shown, consists of two tubes (T T) converging at an angle of about forty degrees. In the lower or convergent end of each tube is placed a lens (L) of the desired strength, usually 20 to 40 D., having curves on its two surfaces, whose radii are to each other as 6 to 1, the more convex surface turned within the tube, to reduce spherical aberration to the minimum. At the upper or divergent end of each tube is placed a prism (P.) of 20 centrad refracting power (about 20 degrees refracting angle), with its base towards the other tube. The course of the two axial

rays is shown by the broken lines starting from the object (O). It will be noted that by the prisms the divergence of the rays is reduced sufficiently to bring it well within the limits of normal convergence power. The diameter of the tubes varies with the strength of the lens employed. With a stronger lens, which necessarily comes nearer the eye under inspection, the diameter is smaller, to secure the proper divergence of the two pencils of rays. With a weaker lens the tube is made larger to secure a larger visual field. With a stronger lens, too, the tube is longer; while with the weaker lens, which has to be placed farther from the eye, the tube is shorter.

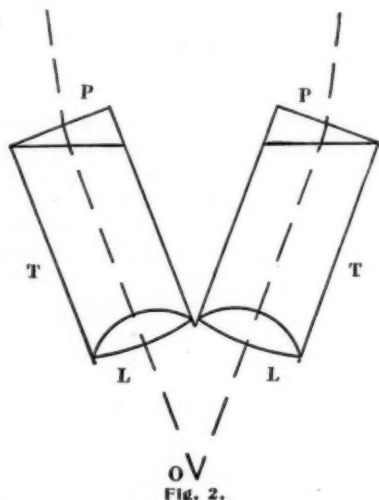


Fig. 2.

In planning the instrument the distance between the divergent ends of the tubes has been made sufficiently small for a person having an inter-pupillary distance of 55 mm. One having a greater inter-pupillary distance needs only to draw back a little from the end of the tube to have it perfectly adapted to his own use. It should be noted, too, that the prism, having the same effect at all parts of its surface, it is not essential to have one's pupil at the center of the upper end of the tube, but that about as good an optical effect is obtained when the pupil is opposite one part of the prism as another. In the adjustment of the instrument it is very important that the two prisms should be

turned with their bases accurately toward the nose, since a slight rotation of one prism from this position will cause a vertical diplopia, that will quite prevent binocular vision through the instrument and entirely defeat its purpose.

In using this instrument the eye should be strongly illuminated from the side. The avoidance of reflections from the cornea is even more important than in the monocular examination, since these reflections necessarily differ so much for the two eyes of the observer that they constitute an appreciable obstacle to binocular fusion. The instrument is at first held closer to the eye to be examined than the focal distance of its lenses, and then gradually withdrawn to the greatest distance at which a clear view can be obtained. At this latter distance one gets the greatest magnification, with the least exertion of accommodation and convergence.

The advantages of binocular over monocular vision in the investigation of unknown conditions have already been referred to. But they will not be fully appreciated in regard to the examination of highly magnified images of the anterior segment of the eye except by one who has experienced them. One careful worker in ophthalmology writes me, soon after getting a binocular lens, "I see what I never have seen before." Another who has worked with the lens some little time says he "would not know how to do without it." The writer after two years of use of such lenses would as soon think of discarding the shadow test or the trial-case. But only experience is likely to convince anyone how much the full revelation of the third dimension or "depth" adds to the significance of the magnified image.

It may be noted that the angle of the divergence of the pencils of rays going to the two eyes, nearly forty degrees, gives in effect a magnification in the third dimension quite comparable to the magnification given by the lenses in the other directions. As compared with the "binocular" compound corneal microscope, the superiority of the "binocular" vision secured by the instrument here described more than compensates for the greater magnifying power of the other; while its simplicity, portability, and the ease with which it is used makes it a perfectly practical instrument for ordinary clinical work. The range of its magnifying power can doubtless be somewhat extended by the substitution for the single lens of carefully chosen combinations of lenses, to reduce still farther spherical and chromatic aberration. But for the present at least it is doubtful whether the increase of power to be so obtained would have much value in the ophthalmic clinic.

A CASE OF DOUBLE CHOKED DISC, CAUSED BY A
CYST, INVOLVING THE RIGHT FRONTAL
LOBE OF THE BRAIN, WITH
AUTOPSY.*

BY HOWARD F. HANSELL, M. D.,
PHILADELPHIA.

The clinical history of the case, briefly described below, is characterized by no especial points of difference from the classical form of choking of the discs as a sign of brain tumor, with the possible exception of the absence of hemorrhages into the tissue of the retina, but it is of interest in that the case was followed for three years through its various changes until the death of the patient gave the opportunity for microscopic study of the pathologic alterations in the retina, nerve head and nerve and a determination of the causes that led to blindness and death.

Lizzie McK., child's nurse, consulted me February 15, 1893, on account of intense headache, dating from exposure to the sun during the previous summer. The family history is irrelative. In her own person acquired syphilis and pulmonary disease could be positively excluded. The menstrual function was regular and painless. The patient was a stout, healthy-looking Irish girl, weighing about 150 pounds. The headaches were frequent, but not constant; intense, but not localized. In the fall of '92 she noticed dimness of vision, and visited a Philadelphia hospital with the purpose of securing glasses for relief from the failing sight and the headache. A low minus spherical was ordered and worn, but produced no improvement. I found V. reduced to light perception in the R. and to $\frac{1}{2}$ the normal in the L. The field of the R. for light was confined to that governed by the foveal region, and that of the L. was concentrically limited for both white and colors, and had no sector defects. Refraction slightly hypermetropic. The discs were enormously swollen, particularly the R., which seemed not only to project forward, but to hang down into the vitreous. The summit of the swelling was 7 D., and the retina at the fovea, I. O. D. The arteries were normal and the veins diminished in caliber. There were no hemorrhages. The swellings of the nerves did not extend much beyond their borders, and the retinae in the immediate neighborhood were

*Read before the American Ophthalmological Society, July, 1896.

healthy. The lower part of the scleral ring in the right was hidden from view by the overhanging nerve. The R. was divergent. After free salivation V. of R. was increased in a small central field from 1 p. to 20/40, and of the L. from 20/40 to 20/20; but the field of the L. did not widen. After maintaining the improvement for some weeks, V. again sank to 1 p. in R. and 20/100 in L. Stretching of the R. optic nerve produced temporary improvement (20/100). The patient became gradually worse, until the summer of 1895, when she became totally blind in both eyes. My next examination was in the spring of 1896. The choked discs had given place to atrophy, with loss of caliber of the retinal vessels. The headache, that had disappeared in part, returned in great severity, and, in addition, the patient had attacks of general convulsions every few days, preceded by sufficient warning to grasp a support, without which she would have fallen to the ground. The pupils during the early course of the disease were dilated, but responsive to light and accommodation, but later, when all l. p. was lost, remained dilated and fixed. My diagnosis from the first had been tumor of the brain, but I was unable to locate it or to assign other cause than exposure to the sun. Later I believed it to be in the anterior lobes, which opinion was concurred in by Dr. Chas. K. Mills, who examined the patient at my request. In view of the rapid mental and physical deterioration, I considered the advisability of having the skull opened, and for this purpose made an appointment with Dr. W. W. Keen. On the morning of the day, a few hours before the time set for his examination, the patient died suddenly in convulsions. The autopsy was made by Dr. Keen, assisted by Drs. Mills, Fegley and myself. Before exposing the brain, it was noticed that the velus of the meninges were tortuous and overfilled. The membranes were not abnormally adherent, and the contour of the convolutions presented nothing unusual. During the removal of the brain from its bed a large amount of fluid escaped from the lateral ventricles. The sense of resistance to touch was uniform, except in the region of the R. frontal lobe, which was, over its entire extent, yielding, showing the absence of support. Upon further dissection, an enormous cavity was found occupying the area of the R. frontal lobe and surrounded by a shell of normal brain tissue. This cavity was connected with the R. lateral ventricle by a canal through which the contents of the cyst had escaped, and through which interchange of fluid during life was constant. No cyst wall, other than brain tissue, no debris and no blood were contained in the cavity. The optic sheaths were enormously distended, as can be seen from the microscopic sections. Just within the entrance of the R. optic nerve into the orbital cavity, two tumors the size of a small bean, and covered by a vascular sheath, were seen to lie in contact with the nerve, and probably to bend it slightly from its course. Their nature, according to the microscopic report, was tubercular.

Microscopic report, by Dr. A. O. J. Kelly, Neurological Laboratory, Philadelphia Polyclinic: "The specimens were the R. and L. optic nerve, with the corresponding posterior segment of the eyeball and two small tumor-like formations, each about the size of a pea, removed from the apex of the R. orbit. Microscopically there is very evident an enormous serous distension of the sheath of each optic nerve, the L. being somewhat more distended than the R. Naked eye examination reveals, also, a very distinct swelling of each optic papilla, both manifesting the usual central depression. The excessive distension of the nerve sheaths is very evident, being pyriform, increasing from before—at the point of entrance of the optic nerve into the eyeball—backward. At the point of greatest disten-

sion of the L. sheath the distance between the sheath and the optic nerve, equals to the diameter of the nerve, the distension of the R. being less marked. The sheaths are throughout their course attached to the nerves, by delicate fibrillary bands traversing the space. Transverse and longitudinal sections of both nerves, reveal similar lesions. The sheaths are greatly thickened and contain the usual proportion of elongated nuclei, with here and there round cell infiltration. In the nerve proper there is extensive round cell infiltration and much new fibrous tissue formation. The epineurium, perineurium and endoneurium are alike affected. The inner sheath of the nerve is quite markedly infiltrated, and the delicate fibrillary bands connecting the inner and outer sheaths are themselves increased, thickened and infiltrated. The inter-neural trabeculae are much thickened and infiltrated with round cells. In some places there is progress towards fibrous formation. The blood vessel walls are much thickened, and in places surrounded by aggregations of round cells. The nerve fibres are degenerated in their entirety, appearing in irregular granular masses, the axes cylinders being no where in evidence. The papillae are much swollen, increased in thickness and exhibit in addition to some new connective tissue formation a very extensive cellular infiltration that partakes of the nature of small round cells, but some of which has already begun to undergo the change into fibrous formation. The cellular infiltration is not only evident in the center of the papillae, but persists to the edges. It is somewhat less marked in the lamina cribrosa, but immediately posterior thereto it assumes again extensive proportions and is much more marked in the papillae than elsewhere in the course of the nerves. The blood vessels are distended and have thickened walls and in places are surrounded by round cell infiltration. The several coats of the eye-ball are separated from each other (this may have been artificial). The retina and choroid present many curves due to their displacement. Near the disc the nerve fibre layer of the retina is greatly thickened and infiltrated with small round cells. There is extensive proliferation of the nuclear layers of the retina, particularly in the vicinity of the blood vessels. In places the proliferating nuclear layers show a tendency to coalesce, overstepping their normal boundaries. The pigment layer persists to the edge of the disc. Microscopic examination of the two small tumors shows them to be tubercular lymphatic nodules. In some portions there is great development of large epithelioid cells, which, increasing and aggregating, displace the lymphoid elements of the tissue. Into some of these foci of epithelioid cell formation, extensive hemorrhage has taken place. In others the tendency to the formation of homogeneous hyaline or faintly granular areas, devoid of nuclei or nearly so is very evident. Bands of connective tissue of varying density pervade the structure. No tubercle bacilli could be discovered."

A condition noted by other observers, namely, extreme tortuosity of the choroidal vessels, giving that membrane the appearance of abnormal thickening, is also present.

A cyst is not anatomically identical with a tumor, but clinically they develop the same symptoms and cannot be differentiated during life, for while in the former there is no actual increase in the volume of the brain, as there is in a new growth giving rise to localizing symptoms, the increased volume of intracranial fluid, directly dependent on the pathologic process, will cause signs of intracranial pressure and mechanically the fluid will seek the nearest outlet, namely, the sheaths of the nerves. In my patient the characteristic symptoms of brain tumor were present—double choked

disc, of high grade, concentric loss of field eventuating in total loss of vision and severe headaches culminating toward the close of life in general convulsions. Localizing symptoms were absent, including those that could be confidently expected in extensive lesions of a frontal lobe. The mind, never highly cultivated, retained its functions during the formation of the cyst, notwithstanding the extensive destruction of white and cortical matter, until the last month or two when intellection became dull and memory defective. There was no albumin or sugar in the urine, no loss of reflexes, no loss of weight or other interference with the bodily functions. The microscopic examination of the nerves and sheaths demonstrate the mechanical interference with the circulation in those structures from pressure and the consequent atrophy of the nerve fibers. The fluid, undoubtedly passed down to the eye from the brain by the sheaths and did not collect as the result of local inflammation of the nerve head from the presence of toxic elements in the fluid. The blindness was subsequent to the headache and the changes seen by the ophthalmoscope kept pace with the presumed growth of the cyst and the persistence of a large amount of fluid in the sheaths.

A CASE OF CHRONIC GLAUCOMA WITH SOME UNUSUAL FEATURES.*

BY ROBERT L. RANDOLPH, M. D.,

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UNIVERSITY AND ASSOCIATE OPHTHALMIC AND AURAL SURGEON
TO THE JOHNS HOPKINS HOSPITAL; OPHTHALMIC EX-
PERT TO THE BALTIMORE AND OHIO RAILROAD.

T. W. Strong, healthy man of sixty-one years of age. He is the manager of a large brewery in Baltimore. Four years ago he consulted me about his right eye. On examination I found the cornea of his right eye the seat of a haze which was so dense as to render quite indistinct the outlines of the pupil. He told me that this haze made its appearance every day at the same time. Usually an hour after breakfast a faint cloud would appear before his right eye and in two hours or maybe a little over, this cloud had become so dense as to make reading with that eye impossible and everything appeared as though seen through a thick veil. This haziness now began to fade away and in two hours the cornea was perfectly clear. Two periods of time served to impress upon him the duration of the haze; he reached his office every morning between half past eight and nine o'clock and the haze began to appear within half an hour; he dined at half past one o'clock and afterwards he would smoke a cigar and by that time it was about three o'clock and the haze had entirely gone. These two points in the history of the condition had impressed themselves upon him, first the beginning, a short time after reaching his office, and the end about the time he had finished his afternoon cigar. The clouding appeared to involve the substance proper of the cornea and was uniformly distributed. There had been no pain, in fact the only unpleasant feature was the disturbance in vision. The ocular conjunctiva was abso-

* Read by title at the thirty-second annual meeting of the American Ophthalmological Society, New London, Conn., July, 1896.

lutely free from congestion and with the exception of the cornea the eyeball seemed perfectly normal. It was impossible to see the fundus owing to the condition of the cornea, so he was told to return that evening after the cloud had passed away, though I must confess that I was rather skeptical of any such result. He came back that night at eight o'clock and the cornea was absolutely clear and bright. The ophthalmoscope showed a high grade of myopia at least 10 D. There was glaucomatous cupping of the disc, but this condition was not by any means striking. The fundus as a whole resembled that which we generally see in very high grades of myopia. With his myopia corrected his vision in his affected eye was 20-40, while the vision in the other eye was nearly 20-20. I may add that he had been complaining for three weeks.

I prescribed eserine, one grain to the ounce to be used three times daily. He returned in five days with the report that the haze made its appearance every day but that it lasted for only an hour or maybe less. A week later he told me that he had not noticed the haze for three days. I lost sight of him then till November, 1895, just four years from the time when he had first been under my care. He had used the eserine off and on during the winter of '91, and had controlled the attacks completely. He was entirely free during the spring and summer of '91, but in the fall of that year, early in November, the haze appeared and he again used the drops with the same good effect. At this time he consulted no oculist. Several times during the autumn of '92, '93 and '94, the clouding was noticed, but it never lasted long as he promptly resorted to the eserine. I may say here that he had never noticed the clouding in the slightest degree in the warm weather, that is to say, during the spring and summer months. In November, '95, the haze returned with vigor and the eserine produced no apparent effect. Early in the month he came to see me with the right cornea so opaque as to resemble a case of interstitial keratitis.

The tension was decidedly elevated and the vision was reduced to 20-200 with glasses. I prescribed a stronger solution of eserine but with no good effect and the vision continued to grow worse. The haze would appear every day and always at about the same time, and generally by the afternoon the cornea had cleared up. He told me that the haze had only persisted two or three times after night-fall and then he had noticed the peculiar halo around the street-lamps. One month later his vision was reduced to the ability to count fingers across the room. Iridec-

tomy was advised. A week later he came and said that he had decided to have the operation performed. During that week he had consulted two oculists and both of them had advised the operation. One of these gentlemen had expressed some doubt as to whether the cloud actually disappeared in the afternoon, and was much surprised to find that such was the case at a second visit in the evening. The operation was performed and in two weeks he was at work again, and now four months after the operation his vision in that eye is 20-40, and he can make out some of the letters in the 20-30 line. About a month after the operation on his right eye the haze was seen for the first time before the other eye and the condition was characterized by the same periodicity. He consented to an iridectomy which was performed. Before the operation the vision in this eye was 20-40, and now he can read several of the letters in the next lower line. There is then no very material improvement in the vision in the eye. It should be said too that the tension in this eye prior to the operation was considerably elevated during the existence of the haze, but not appreciably so at other times. There was marked cupping of the disc.

The striking features in the case are:

1st. The density of the clouding which exceeded anything of the kind that I had ever seen in glaucoma. Tension was elevated during these attacks and he was conscious of a dull pain in the temples.

2d. The periodical nature of the attacks which came on at about the same time every day and passed away at about the same time. The fact, too, that he was entirely free from the attacks during the warm weather though he was not using the eserine.

3rd. The co-existence of myopia and that too of such high grade. He is now wearing,

R. E.—10 D.—1.25 Dc. axis 180°.

L. E.—10 D.—1.25 Dc. axis 180°.

A CASE OF ALCOHOL-TOBACCO AMBLYOPIA WITH
RETINAL HEMORRHAGE ASSOCIATED
WITH PERIPHERAL MULTIPLE
NEURITIS.

BY E. OLIVER BELT, M. D.,
OF WASHINGTON, D. C.

T. A., 35 years of age, came to consult me about his eyes January 13th, 1896. He is a member of a fashionable club where he spends much of his time drinking, nearly constantly. He smokes about fifteen cigars a day. His general health has been much impaired for several months, is a dyspeptic and for a time could hardly walk as a result of multiple neuritis. During this time he had difficulty in reading, seems unable to focus objects easily V. $\frac{20}{80} + 0.5$ D. cyl. 90=20-20.

With the astigmatism corrected he could read a little better, but not without some difficulty. I advised him to wear his glasses, give up smoking and drinking and put himself under the care of his physician to build up his general health. However, he did not follow this advice. On March 4th, I was called to see him by his physician, Dr. T. V. Hammond, who told me he was just recovering from an attack of delirium tremens and that he was nearly blind. I found his V. 6-200 each. Could read J. No. 10 at one foot. Retinal veins were full and there was an extensive retinal hemorrhage in the right eye. Temporal half of each optic nerve was somewhat white. Tobacco and alcohol were absolutely forbidden. Strychnine was prescribed in increasing doses until 1-8 of a grain was taken three times a day. March 20th; there was no trace of hemorrhage, V. 20-200 each. There was a central scotoma for red and green. Having a specific history, sodium iodide and hydrarg. biniod. were given alternately with the strychnine. March 27th; V. 20-40 each. Is smoking two cigars a day. Does not touch alcohol. April 8th; V. 20-20 with glasses. During his convalescence Dr. Hammond

kept him on a diet of meat which he ate in large quantities. He gained in weight, and improved rapidly in every way. The case is of interest from its rapid onset and recovery, from its association with peripheral multiple neuritis, and from there being retinal hemorrhage as a complication.

Dr. Casey A. Wood quotes Dr. Myles Standish as follows.

"The association of a multiple peripheric neuritis, the pathology of which is known, with a toxic amblyopia, the pathology of which is unknown, is particularly interesting and it does not seem improbable that the morbid processes may be identical. In both diseases the tendency of the disease is to recovery, if the use of the toxic agent can be prohibited."¹

The same author quotes Uhthoff as reporting one thousand cases of chronic alcoholism without retinal hemorrhages though "the appearances were those of a very slight neuro retinitis."²

As to the pathology of alcohol-tobacco amblyopia, Dr. Casey Wood says, "The discovery was made in 1882 by Samelsohn, of Cologne, from an examination of the optic nerve of an amblyopic patient and confirmed in the same way by Lawford and Edmunds, Nettleship and Edmunds, Uhthoff, Sacs and others, that the essential lesion in the disease is an axial interstitial neuritis, beginning somewhere between the papilla and the brain and probably extending thence towards both the center and the periphery. As was suspected by the earlier authorities it was the fibers that supply the macular region (one-fourth or one-third of the whole) that are affected; the others generally escape. Although such a conclusion might with almost perfect certainty be prophesied from the fact that central negative scotomata are nearly always constant factors in the disease, yet the confirmatory evidence of autopsies was needed. From these post-mortem observations (thirteen to the date of writing), we may conclude that the fibers supplying the fovea centralis and surrounding macular region, when they appear at the papilla, form a wedge-shaped sector and lie on the temporal side of the optic disc."³

At the last meeting of the British Medical Association, Professor Nuel, of Liege, "showed that in toxic amblyopias, contrary to the common opinion, the primary change was in the macula, and the nerve changes were in the nature of ascending degeneration. The view that this condition is due to a retrobulbar neuritis must, therefore, now be given up."⁴

¹ The toxic Amblyopis, *Annals of Ophthalmology and Otology* Vol. 2, No. 3, p. 241.

² *Ibid.* Vol. 3, No. 4, p. 392.

³ *Ibid.* Vol. 3, No. 4, p. 390.

⁴ *Medical News*, Aug. 29th, 1896.

SYMBLEPHARON.*

WITH THE REPORT OF AN OPERATION.

BY HOMER E. SMITH, M. D.,

OF NORWICH, NEW YORK.

ILLUSTRATED WITH FIVE CUTS IN THE TEXT.

Symblepharon, an adhesion between the eye-lid and the ball or, more properly, between the ocular and palpebral conjunctiva, is rarely a congenital condition, but in the majority of instances is due to injury. Its pathology is exceedingly simple, being that of the cicatricial tissues and this being recognized the key-note of its treatment is struck. It is well-known that cicatricial tissue removed is replaced by cicatricial tissue and therefore operations intended for the correction of this deformity must be essentially plastic in their nature and in view of the fact that there is loss of conjunctiva this must be replaced either with a like tissue or with one which will become like it and serve its function. To relieve this condition, various operations have been proposed and practiced, of which the principal ones will be mentioned.

The first (Figs. 1 and 2) is that of Arlt. This operation is appropriate to small adhesions and its aim is the same as in all others intelligently planned, namely, to replace lost conjunctiva. It consists in dissecting off the attachment, inverting the flap and drawing it down into the inferior cul-de-sac where it is retained in place by stitches passed through the lid, the ends being tied over a piece of wood. The denuded space on the globe is then filled by undermining the conjunctiva and drawing the edges together, uniting them there by stitches. The operation of Knapp in its first stage is essentially the same as that of Arlt and is applicable to larger adhesions. In it the flaps are taken from the adjacent conjunctiva, are twisted into place and united by

*Read before the Chenango Co. Med. Soc.

sutures. A modification of this operation is in taking a bridge of conjunctival tissue from the corneal margin above and sliding it down and across the cornea to fill the gap left where the old adhesions were dissected off.

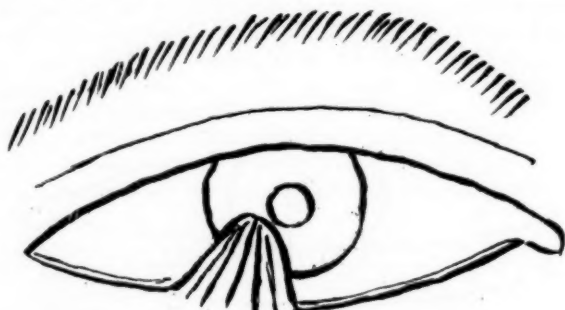


Fig. 1.
Arlt's Operation.

Harlan has operated successfully by an ingenious method in which the adhesions are left upon the globe and the space on the lower lid filled by a skin flap taken from the cheek just below the

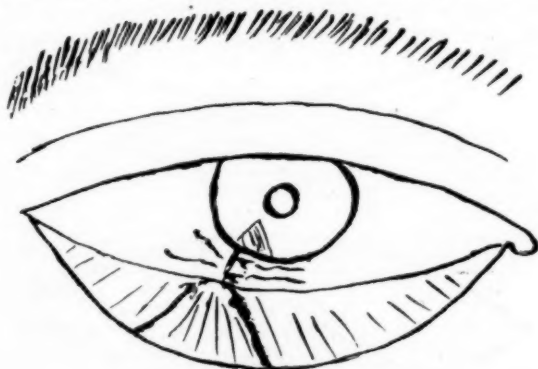


Fig. 2.

Symblepharon detached and fastened to lower lid. Conjunctival gap filled by drawing edges of wound together.

lid. A glance at the sketch (Fig. 3) will render much description unnecessary. In brief, a semi-elliptical flap continuous at its ends with the skin is dissected up from the cheek, the lower lid then freed from the upper margin of the flap which is then

inverted and attached along the ciliary border of the lid. Thiersch's operation by skin grafts from a distance has been proposed and also the transplantation of the mucous membrane from the inner surface of the lip.

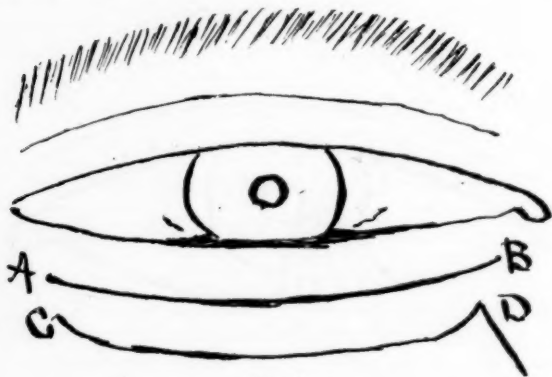


Fig. 3.

Harlan's Operation. The lower lid freed by dissection, a skin flap taken from the cheek inverted and the line C-D attached to ciliary border.

All operations which aim simply at the separation of the lids or the removal of the cicatricial tissue are almost invariably failures. The lids can not be kept apart and the healing process

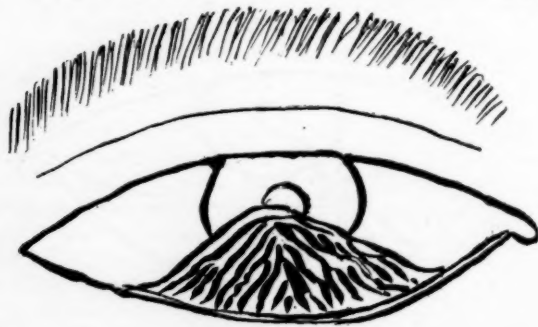


Fig. 4.

Condition before the operation. The lower ocular and palpebral conjunctivae united by thick vascular cicatrices. Neoplasm invading lower half of cornea.

starting from the inferior cul-de-sac in a short time creates new bands of adhesions and the condition in the end is no better than before the operation.

The case which I have the pleasure of presenting to you to-day belongs to the group of extensive adhesions with an extension of the neoplastic formation to the lower half of the cornea. The results in this case have been exceedingly gratifying and, the more so, from the fact that such are generally regarded as very difficult of cure. Stelwag says of them, "when the connecting pieces have a very broad surface, especially if a large part of the conjunctiva, a third or more, is involved and when beside the cornea is largely covered, treatment is generally useless." This patient, as the result of a gun-shot wound happening many years ago, had sustained a loss of conjunctival tissue which involved the outer two-thirds

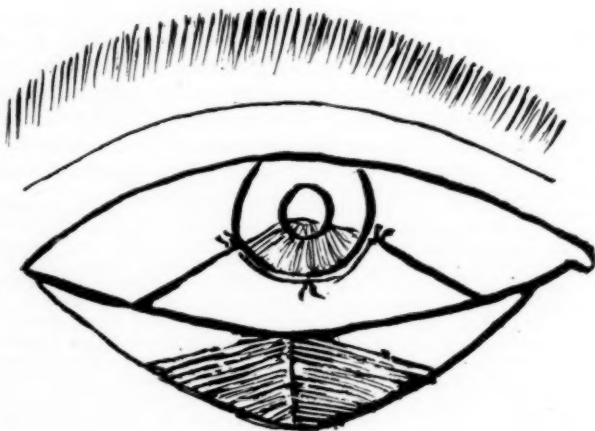


Fig. 5.

The new growth dissected from the globe and inverted the flaps fastened by their apices into the inferior cul-de-sac. Into vacant space left on globe a graft from conjunctiva of rabbit was transplanted and then fastened in place by sutures.

of the lower palpebral and ocular surfaces. The new formation consisted of thick, fleshy, vascular cicatrices (see Fig. 4), which had crept up upon the cornea until its lower half was covered. This not only interfered with motion of the lid, but with vision also, as well as presenting an unsightly deformity. The operation under ether and with antiseptic precautions, was performed for the removal of the neoplastic formations and their replacement by conjunctival tissue taken from the eye of the rabbit.

The accompanying sketches will, it is hoped, assist in making clearer the different steps of the operation. The first stage consisted in dissecting up from the cornea and the globe the adhesions which were then inverted and drawn down into the inferior cul-de-sac and retained in place by sutures. This was the most tedious part of the operation from the difficulty of finding a proper anchorage for the stitches in the deeper tissues which should be far enough down to hold the flaps against the lower lid. This procedure, it is evident, left the smooth outer surface of the flaps in apposition to the globe. In their removal the globe, from its outer two-thirds and lower half, was denuded of conjunctiva and the sclera left exposed. To fill in this gap a rabbit was brought in, anaesthetized, its conjunctival sac washed with a warm solution of boracic acid and as large a piece as possible of conjunctival tissue removed from its eye. This quickly transferred was stitched in place on the denuded globe and the patient put to bed with his eye bandaged. The graft united fully throughout its entire extent. The motility of the lids has been fully restored, the eye, now like its fellow, has been relieved (see Fig. 5) from the unsightly deformity, and the discomfort resulting from the crippled lid has entirely disappeared.

THREE CASES OF DETACHMENT OF THE RETINA,
IN THE SAME FAMILY.

BY B. L. MILLIKIN, M. D.,

CLEVELAND, OHIO.

As bearing upon the possible influence of heredity in cases of detachment of the retina, the following cases are deemed worthy of record. Two of the cases have been under my own observation, while one was treated a number of years since by other gentlemen. Very briefly, the histories are as follows:

Case I. F. A., aged 50. Had always been in fairly good health. Suddenly he noticed some diminution of the lower field of vision of his right eye. This was ascertained to be a detachment of the retina, in the upper portion of his right eye. Although treated for a considerable time by physicians in Cleveland and New York, the case proceeded to a complete detachment of the retina. The other eye never became involved. He died ten years later. So far as his family and friends know, he had never been near-sighted.

Case II. W. A., aged 60. Is an extremely thin and emaciated man, five feet nine or ten inches tall, and probably not weighing much over 100 pounds. He has always had pretty fair health, though frail. Has always been near-sighted. I examined Mr. A. the 2nd of June, 1890, and found present the following conditions:

O. D. $v = 2/60$. O. S. $v = 4/60$.

He stated that he had worn glasses for twenty years for distance, but not for close work. For two or three years he had noticed black spots floating before the eye, and just recently had noticed a black curtain-like obstruction in the lower portion of the field. Examination showed the right eye with a pigment crescent outward from the disc, and a general cloudiness of the entire fundus, with a well-marked retinal detachment in the extreme upper and outer quadrant. The left eye showed much the same general condition of the eye ground, with no detachment. The patient was not seen again until July 22nd, following, when it was found that the detachment had vastly increased, so that the field downward and inward was cut off almost to the fixation point. The patient was then put in bed, compresses applied to the eye, atropia, and internally iodide of potash with strychnia, and every attention given to his diet. In addition, he was given massage, in order to keep his general nutrition in the best possible condition. Patient remained in bed for a month and afterwards lived very quietly, later taking moderate ex-

ercise, and sufficient out-door life to put him in the best possible physical condition. Very briefly the treatment did no good; the detachment progressed to complete loss of the eye. His refraction at the time of the first examination showed in both eyes a myopia of 4.50 D., and this number of glasses he has worn since that time. With these the vision in his left eye has continued about 6/9. Thus far, there has been no indication of difficulty with his left eye, but he has been strictly enjoined against using it for hard, close work, in order to avoid any over-strain which might produce a similar disaster in the sound eye.

Case III. A. A., now 63 years of age. Was first seen by me in January, 1887. My notes show at that time a vision of

O. D. = 6/24. O. S. = 6/18.

There was a manifest hypermetropia of 1.25 Ds. in each eye, which gave normal vision. There was also, of course, presbyopia. The ophthalmoscope showed no abnormal conditions present. Since then, there has been no difficulty with his eyes until very recently. On August 17, 1896, he came to my office, with the history of having noticed some black spots before the right eye for a short time. Two days before his visit he noticed in this eye some flashings of light, and a slight curtain effect below and inward. Examination showed in O. D. $v=6/24$; O. S. $v=6/24$; +1.75 Ds. in each eye, gives $v=6/6$, that in the right not being quite so sharp as in the left. The ophthalmoscope showed the fundus of the right eye fairly clear, except in the upper, outer portion are noted fine fibrillary opacities, extending into the vitreous, behind which, in the extreme upper, outer portion, is a well-marked retinal detachment. The left eye shows fundus normal.

On the 19th of August, the patient was ordered to bed, compress and bandage applied, eserine instilled twice daily, one grain to the oz. solution. Since then, hypodermics of pilocarpine have been used in the right temple sufficient to produce free sweating. The hypodermics have been given three times a week, and he has been kept quietly in bed for a month. He has lived on simple diet, and unquestionably his general health has considerably improved since this line of treatment has been adopted. He has just within the past few days been allowed to sit up, and will be sent off for rest before again undertaking business cares.

Mr. A. is a small, very thin man, and has been actively engaged in business, which recently has been unusually taxing. So far, I do not see that there is any tendency for the detached retinal area to diminish. Of course, what the ultimate result of this last case will be, we are unable at present to determine, but in my own mind, any favorable result is not very probable.

Of interest in connection with the report of these three cases it may be added that in the family there were eight children, all boys, and that seven reached maturity. One died at twenty-six in the army. The oldest brother is still living and fairly well at eighty, the second likewise, at about seventy-eight case III of our series being the youngest of the family. The father died at about fifty-six years of age, of what disease I do not know, while the mother lived to be over ninety.

The interesting points in connection with these cases may be summed up as follows: I. The fact that the right eye in the

same portion of the field has been in each one the point of separation of the retina. II. Of the three cases only one was myopic, and that only in a moderate degree, evidently showing origin of the detachment. III. The rapid development of the detachment in the three cases in spite of any line of treatment pursued. IV. The freedom of the left eye from an attack or other trouble in all the cases. V. The most important of all, the fact of the detachment taking place in the eyes of three brothers, none of whom had suffered from any marked constitutional disorders, and in a large family which has been characterized in an unusual degree by long life and general good health.

AN IMPROVED BIFOCAL LENS.

By W. F. SOUTHARD, M. D.,

SAN FRANCISCO, CAL.

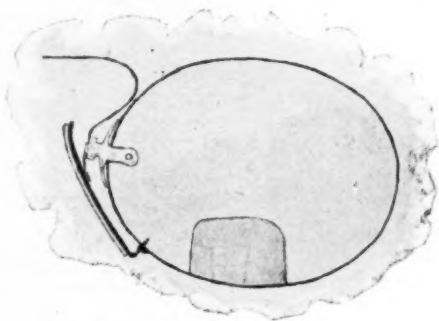
Illustrated.

[Owing to an error in the illustration (page 536, these ANNALS, July, 1896) this paper is republished.]

Having prescribed, as well as having worn bifocals for several years I find that they fail to give that general satisfaction which they deserve. A very considerable number of persons, noticeably advanced presbyopes, soon discard them on account of the dizziness and sense of uncertainty which is experienced by them when walking on the street. I have been informed by several patients, who have tried bifocals that when crossing a crowded street they feel timid fearing injury from passing vehicles. I find that this disturbance is occasioned by the necessity for looking down to see that their footing is secure. As the visual axes pass from the clear upper fields to the lower "segments" the sudden blurring of objects in front of the eyes causes unpleasant mental sensations which many patients can never overcome.

As presbyopia increases, indistinctness of the lower portion of the field must become greater; and a certain amount of apparent displacement of objects also takes place since the visual axes do not pass through the centres of these thick segments. Another source of discomfort is occasioned by the upper edge of the segment which falls just below the pupil; when one is walking and the eyes look at the ground anywhere within a distance of 20 feet, this edge crosses a pupillary space. As about one-third of the area of the lens is covered by the segment the wearer is obliged to look over or under them to see the

foreground distinctly. To overcome these serious objections I have designed the following form of lens which Henry Kahn & Co. of San Francisco have kindly made



for me. The lenses are the exact size of the accompanying cut (33 x 41 mm.) technically known as the 000 eye size. Fig 1. They are bifocals of the cement variety, and the segments are almost square, measuring 10x12 mm. they are decentered inward, for reading approximately 3 mm. in each eye, figuring for convergence at a near point of 12 inches. The result is that we have a bifocal which gives a greatly enlarged field above and at the sides. Walking on the street is unattended with the slightest discomfort. The greatest care must be taken in centering these segments otherwise there will be some disturbance when reading. Although bifocals are not designed for prolonged use at the reading point, nevertheless I have found them so comfortable that I frequently forget to remove them for my working glasses when I sit down to my evening work.

The general appearance of this form of bifocal is greatly in its favor, these little segments at times being scarcely noticeable until one approaches close to the wearer.

603 Sutter Street.

[Dr. Southard does not, of course, claim priority in publication of the foregoing description; his short article is inserted here for the purpose of calling attention to the advantages of the size and shape of the reading lens. C. A. W.]

DOUBLE PTERYGIUM ON ONE SIDE IN A YOUNG SUBJECT.

PETER D. KEYSER, M. D.,

PHILADELPHIA.

ILLUSTRATED.

In all of nature's formations there are found at times oddities, and some of these are so infrequent that they should be reported when occurring.

It is a well-known fact that the growth of pterygium occurs mostly in persons past forty years of age, and also on the conjunctiva of the inner side of the eye-ball. At times it forms on the outer side, and at times both inner and outer grow simultaneously.

The case here reported is interesting in several points—its peculiar formation, rapidity and place of growth, and as occurring in a young subject.

Mr. B., age 22, was brought to my clinic, May 16, 1896, by his father, Dr. B., with a large growth extending from the conjunctiva, over the outer half of the cornea, with the history that three years ago a thickened inflammatory formation appeared in the outer side of the bulbar conjunctiva, unaccompanied with pain, but a feeling of annoyance, etc.

Ordinary collyria were used, which seemed to allay the inflammatory action for awhile, when it would spring up again. It was not very long before the conjunctiva began to grow over the surface of the cornea. It had all the appearance of a pterygium extending over the cornea, but as these growths were supposed to be slow, nothing special was thought of it, until it began to spread unusually far over the cornea, so as to interfere with vision in the eye. The inflammatory, or progressive stage, seemed to gradually pass away, and the tissue become thinner; so, when he was brought to me, I found the peculiar formation of a clearly distinct double pterygium in the chronic, or retrogressive stage. As seen by the accompanying drawing (see Fig. 1, made at the time by one of my assistants, Dr. C. P. Franklin), there are two well-defined apices, with the small vessels running thereto, while the bases of the growths were coalesced.

The growth was too large to remove by any of the recognized methods of Arlt, Pagenstecher, or my own, as published in 1879, or by the usual transplantation; so, after tearing all the attachments to the cornea loose with hook and forceps, I turned the edges well under the conjunctiva, and held them in place by three sutures.

This left a large space exposed on the sclerotica, to cover which the conjunctiva above and below was cut loose for a considerable dis-

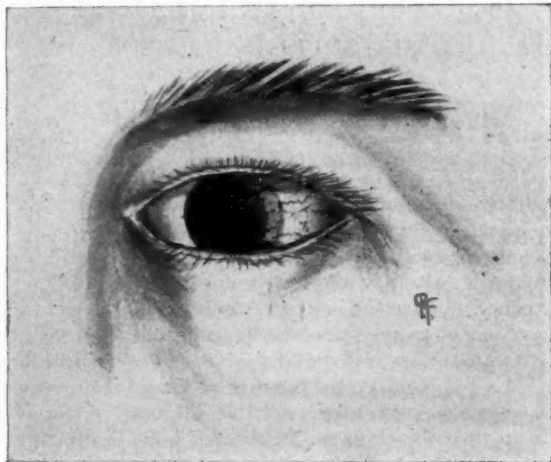


Fig. 1.

tance, and the triangular flaps turned (see Fig. 2) over and laid in the gap and held by sutures, with some stretching, naturally. The

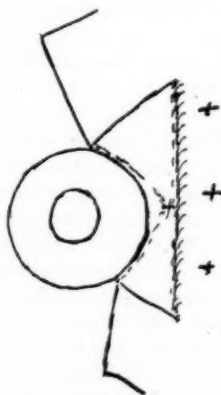


Fig. 2.

wound healed remarkably well, and the cornea has cleared up, leaving only a slight translucency.

A CASE OF SUPPURATIVE IRIDO-CHOROIDITIS
OF OBSCURE ORIGIN, ENDING IN PAN-
OPHTHALMITIS IN AN INFANT
OF NINE MONTHS.*

BY ROBERT L. RANDOLPH, M. D.,

OF BALTIMORE, MD.

Suppurative inflammation of the uvea in children affected with cerebro-spinal meningitis is not such a rare condition, and it is found sometimes with the exanthemata. The following case is interesting not only from the rather unusual course followed by the irido-choroiditis which ended in panophthalmitis and rupture of the eye-ball, but the case is interesting because there was absent throughout any well marked symptoms of a constitutional disease. Last November I was asked to see a baby girl of nine months of age. A week previously the family physician was called in to treat the child for a cold and noticing that the eye was red he had prescribed a boric acid wash, and had given the eye no further thought. At the end of a week his attention was again called to the eye and he noticed a whitish deposit in the pupillary area and concluding that the affection was something more than conjunctivitis requested me to see the child. I found a strong healthy infant, seemingly in no pain and easily diverted by its playthings. The child had no fever, but I noticed that there was a slight coryza showing itself in running at the nose and some little catarrh of the upper portion of the bronchial tubes. Neither one of these symptoms was what I should called marked. The affected eye (left) was somewhat uniformly congested. The cornea was perfectly clear. The pupil was much contracted and its area was filled with a grayish exudate. There was also a deposit of this exudate on the floor of the anterior chamber. The tension of the eye was slightly below the normal, and the eye-ball did not seem sensitive to the touch. I regarded the condition as an irido-cyclitis suppurativa, probably of metastatic origin, and I told the attending physician that I had very little, if any, hope of saving the eye. The appearance of the eye closely resembled what I had seen more than once in cerebro-spinal meningitis. Hot applications were used in the

* Read by title at the thirty-second annual meeting of the American Ophthalmological Society, New London, Conn., July, 1896.

shape of douches and atropia was instilled every four hours. There was, however, not the slightest response on the part of the pupil to the action of the atropia, though on the third day, I made three instillations of a solution of 15 grains to the ounce. On the morning of the fourth day the parents expressed the wish for a consultation and Dr. Samuel Theobald was called in. Dr. Theobald agreed with me in the main, but thought that there was still hope and suggested that the child be put upon small doses of "gray powder" and that inunctions of mercury ointment be made. The infant at this time was a very restless sleeper and Dr. Gamble was obliged to give an anodyne to enable her to rest. She would still, however, take interest in her playthings and notice those in the room and gave no evidence of actual suffering. The treatment suggested by Dr. Theobald was at once commenced and faithfully persisted in for three days, when it was discontinued as Dr. Gamble thought the child was weakening under it, and there was certainly no improvement as a result of its use. The local treatment was of course carried on all this time. On the evening of the fourteenth day from the onset of the trouble I found the eye-ball hard to the touch and on leaving the house with Dr. Gamble remarked to him that I feared panophthalmitis was setting in. The next morning I found the eye protruding and the lids very oedematous. From now on panophthalmitis prevailed in its typical form and at one time I had concluded to open the eye-ball as the child was suffering a great deal. On the evening of the 17th day, that is, three days after the commencement of the panophthalmitis, the ball ruptured at a point just between the cornea and the insertion of the external rectus muscle. The eye-ball at present is $\frac{3}{4}$ the size of its fellow.

My own idea of the case was that the child was suffering with a mild attack of influenza, and that an embolus infected with the bacteria of influenza had gotten into the circulation of the eye and hence the panophthalmitis. I must confess, though, that I was alone in this opinion. If it was influenza the eye affection is easily explained in the manner which I have just indicated, but there was undoubtedly a noteworthy absence of the characteristic symptoms of influenza, in fact nothing beyond the slight coryza which was mentioned. The absence then of any pronounced constitutional affection makes the case particularly interesting. The fact, too, that the irido-choroiditis ended in panophthalmitis adds to the value of this case as irido-choroiditis in children is not usually characterized by violent inflammatory symptoms.

A CASE OF POISONING FROM SCOPOLAMINE.

By C. P. PINCKARD, M. D.,

PROFESSOR OPHTHALMOLOGY POST-GRADUATE MEDICAL SCHOOL; ATTENDING OPHTHALMOLOGIST MICHAEL REESE HOSPITAL DISPENSARY; FELLOW CHICAGO ACADEMY OF MEDICINE.

Mrs. B., age 48, consulted me in August, in regard to trouble with her left eye. Among other things prescribed for her, was a solution of scopolamine hydrobromate of the strength of one grain to the ounce of water. This was to be applied at bed-time and several times during the following day.

She put a drop into each eye at 10:30 that night. The application smarted a trifle, but in about twenty minutes she began to have burning pain in and about the eye, followed by deep pain radiating into the temples and over the head. The pain increased rapidly in severity, and was accompanied by redness and swelling of the lids and face. At the same time there developed great nervousness, dryness of the throat and feeling of faintness. These symptoms continued through the night, the pain getting less, however, but the nervousness was so great that the patient was unable to remain quiet in one position for any length of time. Cold applications were applied by the patient, and next morning, about 7:30, I saw her.

There was considerable puffiness of the lids and around the eyes, and the face was flushed. The bulbar conjunctiva was normal; the pupil widely dilated; iris and cornea normal. The tension of both eyes was decidedly increased, being, perhaps $+1$. The pulse was accelerated, respiration normal, throat dry and parched, with marked soreness in the sides of the neck. The pharynx was somewhat reddened, possibly slightly swollen. There were distinct muscular twitchings in the arms and legs, and also vesical tenesmus. There were no mental phenomena, except the great "nervousness and inability to sleep." No constitutional treatment was given, on account of the inability of the patient to take morphine or similar drugs, because of an idiosyncrasy. The symptoms lasted for 36 hours, with gradually diminishing severity.

This case is, as far as I know, unique in the amount of the drug used. The patient is a delicate woman, with a weak heart, although no valvular disease can be detected. During a trip to high altitudes last summer, she suffered a great deal from her heart, and had repeated fainting attacks. About a year ago she had her pupils dilated with homatropine for refraction purposes, without any inconvenience. There has never been any evidence of glaucoma in the case. Vision is normal. The case shows that scopolamine does increase intraocular pressure, although it has been claimed that it does not.

This is the second case of poisoning from scopolamine in the writer's experience; the other being in a child, the symptoms coming on, however, after repeated applications of the drug. The case was reported in the Medical Standard.

103 State St.

RETINAL HEMORRHAGE CAUSED BY LITHEMIA.

BY A. BETHUNE PATTERSON, M. D.,

ATLANTA, GA.

In looking up the etiology of retinal hemorrhages in some of our text books, I find quite a number of causes are given—among them gout and rheumatism, and I believe it is the custom of many eye surgeons to exclude these as probable causes of the retinal affection where there have not been distinct attacks of the general disease. The etiology of gout and rheumatism is by no means settled, some writers seeming to think that lithemia is the cause of these pathological conditions that vary so widely in their clinical history. My own experience would lead me to conclude that the accumulation of uric acid in the blood is not sufficient to bring about an attack of gout, or rheumatism. I find lithemia a very common condition, while gout and rheumatism are comparatively rare, and then, too, the remedies that so soon correct lithemia, have slight retarding influence upon gout and rheumatism. The almost invariable digestive disorders which accompany these diseases, would naturally direct one's attention to the alimentary tract as the probable seat of special forms of ferments, which are responsible for these distinct pathological conditions. Murchison, it was, who first gave the name lithemia to the abnormal retention in the blood of uric acid; since his studies, considerable attention has been given to the subject by pathologists. About forty different complaints have been traced to the accumulation of uric acid in the blood.

The object of this paper is to attract the attention of the ophthalmologist to lithemia as a frequent cause of retinal hemorrhages. My conclusions are based upon a number of such cases. I can safely state that in arriving at a diagnosis by exclusion, every condition that favored the accident, was critically con-

sidered. It has been my habit for years to make a chemical and microscopic examination of the urine of patients. About three years ago, my attention was first attracted to uric acid salts in the urine of patients suffering with conjunctivitis, asthenopia, retinal hemorrhages, etc. I have the record of over thirty cases of asthenopia which continued after errors of refraction had been corrected and heterophoria excluded, who were relieved by remedies which corrected the excess of uric acid.

While serving as clinical assistant in The Royal London Ophthalmic Hospital, I noticed Drs. Nettleship, Lang and the other surgeons would often make a diagnosis of gouty, or rheumatic conjunctivitis, etc., when patients were subject to attacks of these troubles. On referring to notes taken at the clinics of De Wecker, Galezowski and Panas, of Paris, I find inquiry was frequently made of patients, as to attacks of gout and rheumatism. The cases upon which I have based my conclusions, with the exception of two or three, had never suffered with rheumatism, or gout. The following three cases I give are illustrative of retinal hemorrhages caused from lithemia:

Case 1. Mr. C. W. S., age 45; lawyer. He had trouble with eyes for years: describes them as being "weak"—about four or five years ago was treated by an oculist for conjunctivitis; glasses were also ordered. First came under my care in June, '95, suffering with pain in head and right eye; soreness in latter, also brow and cheek bone. It was during this attack that he discovered vision in right eye almost gone. Ophthalmoscopic examination showed there was a recent hemorrhage in region of macula, pilocarpine internally, and drops of atropine to keep the eye quiet. I lost sight of patient until February, '96, when he returned complaining of pain in head and eye (left), soreness in brow and cheek bone. Tension increased with tenderness; complains of debility and lassitude with accompanying asthenopia; was unable to attend to office work; face pale and anxious look; temperature normal; pulse 100 and tense; no organic lesion of heart; but evidence of hypertrophy; ophthalmoscope revealed fresh hemorrhage. Urine analysis; sp. grav. 1032, reaction acid; no albumin, or sugar, heavily charged with crystals of uric acid, and at times scalding. Never had gout, or rheumatism; has had several attacks of renal colic during the last five or six years, also several attacks of what was thought to be hepatic colic; up to these attacks had suffered for years with dyspepsia; has been quite free of the distressing symptom of late. Believing these symptoms to be due to lithemia, I placed the patient at once upon Alkalithia. Rochelle Salts to relieve the bowels and to drink freely of Bowden Lithia Water. A month later reported his condition improved; has been free of pain in head and eye. At this writing is conducting the work of his office with comfort and with no history of recurrent hemorrhage and with improvement in health generally.

Case 2. Miss M. C., age 20. From childhood has suffered with bilious attacks, constipation and general disturbance of digestive

organs; mental depression and irritability; pain in head and eyes, smarting and gritty sensation in lids, so great was the asthenopia that she was unable to continue at school notwithstanding the treatment she had received for conjunctivitis and the correction of half a dioptre of hypermetropia. Saw her a few hours after the retinal hemorrhage occurred; stated that for several days she had been suffering with indigestion, languid and depressed; headache and inability to use eyes for near work. Temperature normal, pulse 110, No organic lesion. Urine test, sp. grav. 1030. No albumin, or sugar, acid reaction high colored, scant and burning, highly charged with crystals of uric acid; had a slight attack of rheumatism when a child. Ordered a purgative and a mixture of acetate potash, digitalis and salicylate soda and to drink freely of water. I have kept this case under observation now for over two years. There has been no return of hemorrhage and she is entirely relieved of asthenopia. She returns to her medicine whenever she feels prodromic symptoms of lithemic outbreak.

Case 3. C. Y. Mc., age 45. For years has suffered with attacks of indigestion accompanied by constipation, loss of appetite, sour stomach; pain in head and eyes; loss of energy, accompanied by mental hebetude and despondency. History of eye, strain for near work; wears + 2.50 which has proved satisfactory. Has never had gout, or rheumatism. Urine frequently high colored, scant and scalding. In February last during one of these attacks had an acute pain in left eye and at once discovered that he was almost blind in it. He consulted an oculist, who discovered a recent hemorrhage of retina. The patient was placed upon pilocarpine internally and atropine drops to keep the eye quiet. Five months later he came under my care with history of several hemorrhages. I found the eye under the influence of atropine; tension increased and ball tender; at times the pain in eye was very severe. No light perception. Urine analysis, sp. grav. 1028; reaction acid. No trace of albumin, or sugar; high colored, scant and burning; heavily charged with uric acid crystals. Atropine discontinued and eserine instilled. I think the tension was largely due to dilated iris incroaching upon the drainage tubes. Rochelle salts was ordered to be taken every morning before breakfast to keep the bowels in a relaxed condition. Alkalthia four times a day and to drink copiously of Bowden Lithia Water. He reported at the end of a week, very much improved; feels brighter and more cheerful, has had no pain in head or eye; tension nearly normal. At the end of second week eye still comfortable with no return of pain, the longest period of freedom from pain since first attack. Sp. grav. of urine 1022; reaction acid. No albumin, or sugar. Microscope showed a great diminution in uric acid.

Since writing the above, I have read in the New York Medical Journal, an article by Thomas J. Mays, on the Treatment of Hemoptysis. The following quotation illustrates the degenerating influence of uric acid upon the capillaries of the lungs. He says: "Dr. Haig, in his work on uric acid, speaks of the important relationship which exists between uric acid in many cases of hemoptysis, and advocates the administration of the salicylates under such circumstances. At first sight, this connection may seem rather vague, but the good effect which follows such a line of treatment, makes it altogether obvious.

There is no doubt in my mind that uric acid sustains some causative relation to pulmonary blood spitting, for I have seen many striking examples in which the sodium salicylates exercised greater hemostatic properties than anything else which was administered. The following is a typical example of this influence." After reporting a case, he continues: "This was my first case of hemoptysis in which I was brought fully to realize that rheumatism might become one of its important complications, and serve to point out the proper line of giving relief, and this fortunate realization, I ascribe wholly to my familiarity with the work of Dr. Haig. I have seen the same condition since, in other cases, and met its therapeutic indications by administering the salicylate of sodium in proper doses. Dr. Haig also advises the giving of mercury iodide, for the same purpose, where there is an excess of uric acid in the blood, as indicated by crystals of uric acid salts found in the urine by microscopic examination." I usually prescribe Alkalithia, and the drinking freely of Bowden Lithia Water. I find this sufficient in combination with saline laxatives, especially so in red and inflamed lids, and in many cases of chronic catarrh of the throat and middle ear.

A NEW CLASSIFICATION OF THE MOTOR ANOMALIES OF THE EYE, BASED UPON PHYSIOLOGICAL PRINCIPLES.

THE PRIZE ESSAY OF THE ALUMNI ASSOCIATION OF THE COLLEGE OF PHYSICIANS AND SURGEONS, NEW YORK FOR 1896.

BY ALEXANDER DUANE, M. D.,

NEW YORK.

ILLUSTRATED.

Introduction.—Sketch of previous classifications.—Development of the idea of an etiological, as opposed to a simple anatomical classification.

- I. **Nature of the problems that have to be solved** in undertaking a physiological classification.
- II. **The Movements of the Normal Eye.**—Actions of the individual muscles.—Movements of each eye individually and the muscles by which they are performed.—Amount of these movements.—Field of fixation.—Author's experiments.—Power of the individual muscles.—Coördinated movements of the two eyes.—Table of associated parallel movements and the muscles producing them.—Associated antagonists.—Field of binocular single vision and of binocular fixation.—Author's experiments.—Movements of convergence.—Power of convergence.—Convergence near-point.—Prism-convergence.—Movements of divergence.—Nature of divergence action.—Movements of sursumvergence.—Rotation movements.—Appendix.—Diagrammatic representation of the movements of the eye.
- III. **The Tests Employed and Their Significance.**—Object of the tests.—Tests for binocular distant fixation.—Inspection.—Fixation and diplopia tests.—Equilibrium tests.—Screen test.—Parallax test.—Tests for associated parallel movements.—Tests for convergence.—Tests for divergence.—Tests for sursumvergence.—Way in which the tests are applied in practice.

INTRODUCTION.

The nomenclature and classification of the muscular anomalies of the eye have been passing through the same stages that have been noted in the evolution of the nosology of other parts of the body. In the progress of our knowledge in regard to any given

set of ailments, the first classification has always been based upon that which first strikes the eye of the observer, namely, the outward appearances and symptoms. Thus, many cases of renal disease were first classified as dropsy, and dropsy formerly figured among physicians, as it does still among the laity, as a substantive disease, and to be treated as such. But, as medical science progressed, and the underlying causes of disease were more and more brought to light, it became evident that dropsy is a symptom only and to be treated as a symptom, and that the principles of a rational pathology require us to search for the causes of the dropsy and to institute treatment addressed to the removal of these causes rather than to the direct relief of the dropsy itself. In this way a pathological classification is gradually substituted for one that is purely symptomatic, and a scientific, casual treatment for one that is empirical, or based solely on the appearances presented.

This conception of disease as a symptom of a pathological process, and the consequent conviction that our therapeutics must be based ultimately upon an etiological foundation, could not have developed, or at all events, could not have become anything more than a plausible theory, barren of practical application, were it not constantly fortified by a steady increase in the number and precision of our means of diagnosis. In this way only can we make those fine discriminations between symptoms that enable us to form accurate inferences as to the diverse origin of phenomena which, to a cursory observation, seem identical. For example, our knowledge of the symptomatic nature of dropsy and of the necessity of treating it from an etiological standpoint, however true it might be, would be a theory only, unprovable and practically inapplicable, were it not for the refined means we now possess for examining the chest and abdomen and for analyzing the urine. These diagnostic means have enabled us to convert theory into fact, and to redeem our treatment from the charge of empiricism.

A similar process of evolution has taken place in regard to the motor anomalies of the eye. These were formerly (and to a great extent still are) classified simply according to the appearances presented, i. e., as inward, outward, upward, or downward deviations. And, to recur to our former illustration, just as dropsy used to be treated as dropsy, regardless of whether it was due to renal, cardiac, or hepatic disease, so an inward squint was (and often still is) treated simply, as a squint, quite without reference to its origin. The results in both cases have often been disappointing.

The first great step in advance was taken by Donders, when he demonstrated the frequent connection and apparent causal relation between strabismus convergens and hypermetropia, and between strabismus divergens and myopia. And, while subsequent writers have doubtless gone too far in asserting the universal application of his deductions, the service that he himself did to rational therapeutics by indicating one large class of cases in which a strictly causal treatment relieves the symptoms, can scarcely be overestimated.

Another exceedingly important advance made was in the discovery of the insufficiencies and of the methods of estimating them. These latter, devised by V. Graefe, remain to-day among the chief means of discriminating between the various motor anomalies; and their invention, as in the case of all new methods of precision, opened the way to still further discoveries.

The diagnosis and symptomatology of paralytic deviations was also worked out by the same author, and in a manner so admirably complete, that little remained for his successors to do except to gather statistics in regard to the precise etiology of these interesting affections.

V. Graefe had pointed out the relation between insufficiency and squint, but since his time this relation has been largely overlooked, the consequence being that the two conditions have often been classed as categorically distinct, and distinct principles of treatment have been applied to them. This arbitrary separation of two things really the same has had a retarding influence upon the development of our knowledge of muscular anomalies.

It became, after awhile, apparent that the very term insufficiency was a defective one, implying, as it did, a casual relation, which was by no means always present. Hence, Stevens in this country proposed a system of classification in which the term insufficiency was replaced by *heterophoria*, and the term strabismus by *heterotropia*, the former indicating a tendency to deviation, which tendency is habitually overcome, and the latter a deviation which is more or less constantly present. The further use of the prefixes Eso-, Exo-, and Hyper-, served to differentiate between deviations or tendencies inward (convergent deviation), outward (divergent deviation), and upward (or, more properly, divergence in a vertical plane). This classification is extremely convenient and has been generally accepted, at least in America. Furthermore, the instruments of precision, which the same author devised for measuring the various deviations, are doubtless the best extant, and have greatly facilitated the recognition and differentiation of the anomalies in question.

Stevens also did service in pointing out that many cases of so-called insufficiency, or heterophoria, were really low degrees of squint—a fact which, as already stated, has been too much overlooked.

He further called particular attention to the importance and frequency of the vertical deviations which had received (and, in fact, still receive) too little notice; the fact being that their recognition and correction are very necessary features in the management of many cases of muscular trouble.

Stevens' classification, however, is open to the serious objection that it reinstates the idea of grouping deviations according to their anatomical characters and puts the etiological element in the background. That is, it aims to classify motor disorders according to their outward, visible characters, and not according to their cause. In this way, though admirable in other respects, it would seem to be a distinct step backwards. Thus, while the term insufficiency is faulty, because it restricts too narrowly our conception of the possible etiology of a given motor affection, the term heterophoria is objectionable, because it throws away the etiological idea altogether, and once more directs our attention simply to the appearances present, i. e., to the fact that the eye in a certain case deviates up, down, out, or in. To be sure, this has its advantages in that there are many cases in which we cannot say at once, or even after considerable testing, what the true condition underlying these appearances is, and we have, therefore, to content ourselves with a provisional—i. e., an anatomical—diagnosis. But we should always feel that such a diagnosis is provisional, and that a really satisfactory diagnosis should express the cause of the deviation as well as its character. That is, the statement that in a given case so many degrees of esophoria were found should be regarded as only an incomplete presentation of the facts; the final diagnosis not being reached until we have determined the cause of the esophoria, i. e., have made out which one of the many and complex functions of the neuro-muscular apparatus of the eye is deranged. In the meantime, the terms that Stevens has devised are very convenient for purposes of record and for indicating the provisional diagnosis.

The next step naturally left to take—the classification, namely, of the motor affections of the eye upon an etiological basis—has been but partially made. Apart from Donder's researches before mentioned, and V. Graefe's demonstrations of the characters

displayed by parietic squint, the main contributions to the subject have been A. Graefe's description of convergence-insufficiency, Landolt's observations upon the comparative effect and relative value of advancement and tenotomy in the treatment of various kinds of strabismus, and some of Stevens' recent papers.

Nowhere, however, have the observations bearing upon this point been properly co-ordinated, so as to form a complete classification of all the different anomalies, founded upon a strictly etiological and physiological basis. To do this, at least in part, is the object of the present essay, which is based almost exclusively upon observations made by the author himself during the past ten years. The subject has seemed to him to be one not only of scientific interest, but also of great practical importance, since, as experience has shown, our plans of treatment are necessarily largely modified by our notions of the real nature and causes of the condition that we are called upon to correct. Moreover, the cases themselves are very numerous; their symptoms, subjective and objective, are multiform and complex; while the results of treatment, which are often brilliant, are often also disappointing, owing, no doubt, frequently, to our ignorance of the exact nature of the case before us. It has seemed proper, therefore, to enter into considerable detail in trying to determine what should be the proper classification of such cases, and what precisely are the differential marks by which they can be distinguished one from the other.

I.

NATURE OF THE PROBLEM.

The task that confronts us when we attempt to make any classification of the kind now essayed is that of framing a scheme by reference to which the following problem may, in most instances, at least, be resolved: *Given a case with a certain train of symptoms, to determine the ultimate cause of these symptoms, i. e., the part or function that is primarily deranged, and the manner of its derangement.* The solution of this problem obviously presupposes, first, an accurate knowledge of the normal state of the various parts and functions that may be involved, and, second, a consideration of the different means we have for determining whether each part or function is actually normal or not. Thus, in the case of deformities about the hip, a proper classification, i. e., one which tells us whether any given deformity is due to a fracture, to a dorsal dislocation, or to hip-disease, is possible only after we have become thoroughly acquainted with the normal relations and movements of the hip-joint, and with the means at our

command for appreciating the various deviations from the normal and their significance. Applying this principle to the eye, we may say that the solution of our problem is contained in the answers to the following questions:

(1). What are the different normal functions of the neuromuscular apparatus of the eye, and what is their anatomical seat?

(2). In what way is it possible for these functions to be deranged?

(3). What means have we for telling whether any special function is deranged or not, and, if so, what the nature of the derangement is?

(4). What are the conditions actually met with in practice, and how do they correspond to the scheme that we have framed?

The consideration of these questions we will now take up in the order named.

II.

MOVEMENTS OF THE NORMAL EYE.

The functions concerned in the group of cases under consideration comprise (a) the *actions of the individual muscles* that are inserted into the eyeball; (b) the *movements possible to each eye separately* through the individual or concerted working of these muscles and (c), the character and extent of the *movements actually performed by the two eyes when acting together*.

The **actions of the individual muscles** are best exhibited in tabular form, as follows:

Muscle	Field of action limited to	Moves eye laterally.	Rotates upper end of vertical meridian of cornea (torsion effect.)	Lateral and torsional effects increasing as eye is	Lateral & torsion effects diminishing to zero, as eye is	Moves eye vertically	Vertical action increasing as eye is	Vertical action diminishing as eye is
External Rectus.	Outer half of field of fixation	Out	No action			No action		
Internal Rectus.	Inner half of field of fixation	In	No action			No action		
Superior Rectus.	Upper half of field of fixation	In	In	Adducted.	Abduct.	Up	Abduct.	Adducted
Inferior Rectus.	Lower half of field of fixation	In	Out	Adducted.	Abduct.	Down	Abduct.	Adducted
Superior Oblique	Lower half of field of fixation	Out	In	Abduct.	Adduct.	Down	Adduct.	Abduct
Inferior Oblique	Upper half of field of fixation	Out	Out	Abduct.	Adduct.	Up	Adduct.	Abduct

It will be seen from the foregoing table that under ordinary conditions the only two muscles which precisely counteract one another's action, or which are, in the language of physiology, direct antagonists, are the external and internal recti.

The superior and inferior recti, for example, are only partially antagonistic, for, while respectively elevating and depressing the eye, so as to be directly opposed to each other in this regard, and while their action in rotating the vertical meridian of the cornea is also precisely opposite, they both adduct the eye. Hence, when acting together they will reinforce the internal rectus, and this action will be most strongly pronounced when the eye is already markedly adducted, i. e., under conditions in which the internal rectus is working at some mechanical disadvantage. The like is true of the combined action of the two obliques, which neutralize each other as far as rotation of the vertical meridian and as far as elevation and depression are concerned, but work together in producing abduction and hence assist the external rectus, especially when the eye is already strongly abducted. On the other hand, when the eye is strongly adducted, the lateral action of the two obliques falls away, and these two muscles act simply to elevate and depress the eye respectively. In this position, therefore, they do neutralize each other perfectly, and are direct antagonists. The same is true of the superior and inferior recti when the eye is abducted. For further remarks upon this subject, see the appendix of this chapter.

Almost every movement that the eye can make *requires the combined action of at least two* of the ocular muscles. Thus to lift the eye straight upwards, we must use both the superior rectus and the inferior oblique.

The superior rectus, acting by itself, would carry the eye inward as well as upward, and would rotate the vertical meridian of the cornea inward. So, too, the inferior oblique, acting by itself, would tend to abduct the eye and rotate the vertical meridian outward. Neither, therefore, alone will carry the eye straight upward, but the two acting together, will neutralize each other as far as their lateral working and their effect upon the vertical meridian are concerned, and consequently the eye rises vertically, without swerving to the right or left, and without any deflection of its vertical meridian.

It is probable that the external and internal recti assist in maintaining the strict verticality of this movement, their simultaneous contraction steadying the eye and preventing it from swerving. In this case, therefore, at least two, and probably four muscles, are concerned in the movement.

Similarly, depression of the eye is always accomplished by the conjoint action of the inferior rectus and the superior oblique, which neutralize each other to a greater or less extent, as far as their lateral working and their effect upon the vertical meridian are concerned, but which assist each other in carrying the eye downward. Here, too, probably the external and internal recti come into play as steadying and supporting factors.

Even in so simple a movement as that of abduction, which might be performed by a single muscle, it is probable that at least two

(i. e., both obliques), or even four other muscles (i. e., all except the internus), take part either in reinforcing the action, or in steadying the eye and rendering the movement uniform. See appendix.

The movements of the individual ocular muscles are, as is well known, *presided over by more or less discrete nuclei* scattered along the walls of the third ventricle, aqueduct of Sylvius, and fourth ventricle; but the precise method in which these are arranged and inter-connected has not yet been sufficiently determined.

The Movements Possible to the Eye through the co-ordinated action of its six muscles comprise rotations in every conceivable plane, the eye being capable of moving from the primary position directly to any secondary position, and from the latter again to any other secondary position, and in so doing may take either a direct or a sinuous course.* The typical direct movements from the primary position, together with the muscles concerned in the production of these movements, are shown in the following table:

*This may be proved by making two fine dots upon a card, so close together that unless very accurately fixed (i. e., if seen ever so slightly in diffusion circles), they will blend into one, and then moving the card slowly in all directions before the eye, the head remaining fixed. However the card is moved, the two dots will remain distinct, thus showing that the eye follows them in all their movements.

Direction of movement from primary position.	Muscles Concerned.	Move Eye Laterally*	Move Eye Vertically*	Rotate Upper End of Vertical Meridian of Cornea*	Resultant Effect Upon Eye.
Out (Abduction)	External Rectus	Out	No action.	No action.	Eye carried out mainly by action of external rectus assisted by the two obliques; the effect of the latter being the greater the more the eye is abducted. The opposing (adducting) action of the superior and inferior recti also diminishes as the eye is abducted. The eye is steadied and its vertical meridian kept vertical by the traction exerted by the superior and inferior recti and the two obliques.
	<i>Synergists.</i>				
	Superior Oblique	Out } Action increasing the further the eye is abducted.	[Down] } Action equal and opposite; decreasing the more the eye is abducted.	[In] } Actions equal and opposite; increasing the more the eye is abducted.	
	Inferior Oblique	Out }	[Up] }	[Out] }	
	<i>Opponents.</i>				
	Superior Rectus.	In } Actions slight and decreasing the more the eye is abducted.	[Up] } Actions equal and opposite; increasing the more the eye is abducted.	[In] } Actions equal and opposite; decreasing the more the eye is abducted.	
In (Adduction.)	Internal Rectus	In	No action.	No action.	Eye carried in mainly by internal rectus, assisted by the superior and inferior recti: the effect of the latter being greater, the more the eye is adducted. The opposing (abducting) action of the two obliques diminishes as the eye is adducted. The eye is steadied and its vertical meridian kept vertical by the counterpoising action of the two obliques and the superior and inferior recti.
	<i>Synergists.</i>				
	Superior Rectus	In } Action increasing the more the eye is adducted.	[Up] } Actions equal and opposite; decreasing the more the eye is adducted.	[In] } Actions equal and opposite; increasing the more the eye is adducted.	
	Inferior Rectus	In }	[Down] }	[Out] }	
	<i>Opponents.</i>				
	Superior Oblique	Out } Action slight and diminishing as the eye is adducted.	[Down] } Action equal and opposite; increasing the more the eye is adducted.	[In] } Actions equal and opposite; diminishing as eye is adducted.	
	Inferior Oblique	Out }	[Up] }	[Out] }	

* Movements that are completely neutralized by the action of opposing muscles are placed in brackets.

Direction of Movement from Primary Position.	Muscles Concerned.	Move Eye Laterally	Move Eye Vertically	Rotate Upper End of Vertical Meridian of Cornea	Resultant Effect Upon the Eye
Up (Sursumduction)	Superior Rectus	[In] Movements equal and opposite.	Up.	[In] Actions equal and opposite.	Eye carried straight up; vertical meridian remains vertical. The counterpoising action of the internal and external recti serves to steady eye and keep it in the vertical line.
	Inferior Oblique	[Out]	Up.	[Out]	
	<i>Synergists.</i> External Rectus	[Out] Actions equal and opposite.	No action	No action	
	Internal Rectus	[In]	No action	No action	
Diagonally Up and Out.	Superior Rectus	[In]; Action slight and diminishing as eye is abducted.	Up. Action marked and increasing as eye is abducted.	[In]; Action slight and diminishing as eye is abducted.	Eye carried up mainly by superior rectus, the elevating action of this muscle increasing and that of the inferior oblique diminishing as the eye is abducted. Eye carried out mainly by external rectus, assisted by inferior oblique, especially when abduction is marked. Vertical meridian rotated out.
	Inferior Oblique	[Out]; Action increasing as eye is abducted.	Up. Action slight and decreasing as eye is abducted.	[Out]; Action marked and increasing as eye is abducted.	
	External Rectus	[Out].	No action.	No action.	
Diagonally Up and In.	Superior Rectus	[In]; Action increases as eye is carried inward.	Up; Action slight and decreasing as eye is abducted; finally 0.	[In]; Action increases as eye is carried in.	Eye carried up mainly by the inferior oblique, the elevating action of this muscle increasing and that of the superior rectus decreasing as the eye is abducted. Eye carried in by the internal rectus, assisted, especially when adduction is marked, by the superior rectus. Vertical meridian rotated in.
	Inferior Oblique	[Out]; Action slight and decreasing as eye is carried in.	Up; Action marked and increasing as eye is carried in.	[Out]; Action slight and decreasing as eye is carried in.	
	Internal Rectus	[In].	No action.	No action.	
Down (Deorsumduction)	Inferior Rectus	[In] Actions equal and opposite.	Down.	[Out] Action equal and opposite.	The eye carried straight down, vertical meridian remaining vertical. External and internal recti by their countertraction serve to steady eye and keep it in the vertical line.
	Superior Oblique	[Out]	Down.	[In]	
	<i>Synergists.</i> External Rectus	[Out] Actions equal and opposite.	No action.	No action.	
	Internal Rectus	[In]	No action.	No action.	

Direction of Movement from Primary Position	Muscles Concerned.	Move Eye Laterally.	Move Eye Vertically.	Rotate Upper End of Vertical Meridian of Cornea.	Resultant Effect Upon Eye.
Diagonally Down and Out	Inferior Rectus.	[In]; Action slight and diminishing as eye is abducted.	Down; Action marked and increasing as eye is abducted.	[Out]; Action slight and diminishing as eye is abducted.	The eye carried <i>down</i> mainly by inferior rectus, the depressing action of this muscle increasing and that of the superior oblique decreasing as the eye is abducted.
	Superior Oblique.	Out; Action increasing as eye is abducted.	Down; Action slight and diminishing as eye is abducted.	In; Action increasing as eye is abducted.	Eye carried <i>out</i> mainly by external rectus, assisted especially in extreme abduction, by the superior oblique. Vertical meridian rotated <i>in</i> .
	External Rectus.	Out	No action	No action.	
Diagonally Down and In.	Superior Oblique.	Out; Action slight and diminishing as eye is abducted.	Down; Action marked and increasing as eye is carried inward.	In; Action slight and diminishing as eye is abducted.	The eye carried <i>down</i> mainly by the superior oblique, the depressing action of this muscle increasing and that of the inferior rectus diminishing as the eye is abducted.
	Inferior Rectus.	In; Action increasing as eye is abducted.	Down; Action slight and diminishing as eye is abducted.	Out; Action increasing as eye is abducted.	Eye carried <i>in</i> mainly by the internal rectus, assisted, especially in extreme adduction, by the inferior rectus; vertical meridian rotated <i>out</i> .
	Internal Rectus.	In.	No action.	No action.	

The amount that the eye can move in each one of the directions specified may be determined experimentally by placing the subject experimented upon with his eyes in the primary position and directed at an object whose recognition implies accurate fixation, (e. g.) a fine double dot on a card, and then moving the object in the given direction, requiring the patient at the same time to follow it with his eyes, but not with his head. The moment when he ceases to follow it will be evidenced objectively by the perceptible wavering of the eye, which hitherto had steadily followed the object, and subjectively by the fact that the object itself becomes confused and no longer recognizable. Then the arc through which the eye has rotated in passing from the primary to the terminal position may be measured either roughly with the eye, or accurately by some form of perimeter.*

*This may also be accomplished by Stevens' tropometer or some similar instrument which measures the rotation of the eye by measuring the arc traversed by the corneal reflex.

By ascertaining the limits of movement in all directions, we define the boundaries of the *field of fixation* i. e., of the entire space through which the visual line can be carried without moving the head.

The measurement of the field of fixation in any given case requires that the patient under examination shall, in each excursion that he makes with his eyes, put forth the maximum effort of which he is capable. This he will frequently fail to do, thereby making the field appear incomplete. It is only by making several examinations and taking the maximum of all the measurements, that we arrive at a perfectly reliable result, i. e., one which shows the full extent of excursion of which the eye is capable. The discrepancies thus obtained in repeated examinations are well shown in cases 1, 5, and 6, of the following table, which is constructed from observations of my own, made upon normal eyes with the perimeter, and using the fine double dot as a test-object.

RIGHT EYES*

Case.	Up	Up & Out	Up & In	Out	In	Down	Down & Out	Down & In
1 1st exam.	40	35	40	35	40	70	35	25
" 2d exam.	38	45 ^o	40	48	48	42	55	50
2	40	50	40			45	60	60
3	50 ^o	45	55	55	45	60	65	55
4 Right eye not examined.								
5 1st exam.	40	48	(50)	60	(50)	62	65	(50)
" 2d exam.	40	48	(55)	50	(55)	(62)	50	(60)
" 3rd exam.	(30)	42	(42)	50	(45)	60	65	(60)
6 1st exam.	32	45	32	52	52		65	50
" 2d exam.	38		50					
7	32	35	35	55	52	72	65	(62)
8	44	55	55	60	60	62	70	(65)
9	50	50	60	52	(60)	80	(70)	60
10	40	40	42	50	42	45	50	40
11 1st exam.	47	50	50	40	63	63	67	55
12 Right eye not examined.								
13	45	55	(55)	50	60	55	52	(53)
14 1st exam.	52	60	55	52	50	62	60	55
" 2d exam.	40	50	(45)	65	(50)	65	80	(50)
15	(50)	45	52	48	56	62	58	(60)
16 1st exam.	52	50	55	48	56	60	60	(50)
17 1st exam.	40	38	50	40	(45)	68	(65)	(50)
" 2d exam.	47	52	52	48	(48)	60	(40)	60
18	60	70	62	75	60	65	73	60

*Figures enclosed in parentheses mean that at this point the test object disappeared from view behind some projecting part of the face, but at the time of disappearance was still within the field of fixation.

LEFT EYES.

Case	Up	Up & Out	Up & In	Out	In	Down	Down & Out	Down & In
1 1st exam.	50	40	45	35	45	70	60	50
" 2d exam.	42	40	55	48	60	70	50	60
2	40	50	40			60	50	60
3	35	40	45	55	50	65		75
4	40	38	46	48	40	35	38	32
5 1st exam.	40	52	42	53	[48]	65	70	[50]
" 2d exam.	43	50	[44]	52	48	[68]	62	[48]
" 3rd exam	42	50	40	48	[50]	65	60	[50]
6 Left eye not examined.								
" " " " "	35	42	45	55	52	70	65	60
8 Left eye not examined.								
9	55	60	60	58	60	72	75	[40]
10 Left eye not examined.								
11 1st exam.	50	45	55	47	60	65	68	60
12	50	60	50	50	[60]	70	62	[40]
13	[40]	55	50	50	[50]	60	75	
14 1st exam.	46	60	55	55	45	72	72	60
" 2d exam.								
15	48	50	50	56	55	65	60	[60]
16 1s exam.	48	55	52	55	52	60	55	52
17 1st exam.	40	42	[50]	40	62	70	60	[52]
18 2d exam.	44	50	50	48	[50]	62	62	[40]
"	58	71	71	72	62	72	76	68

The average of the observations above tabulated gives rather a larger field of fixation than has been obtained by other experimenters. Thus, Landolt's figures, while showing a close agreement for excursions in the upper field, are appreciably less for movements downward (about 50° in looking down, 38° in looking down and out, and 47° in looking down and in). On the other hand, the experiments of Schuurmann and Donders give the range of downward excursion as 57°, which is somewhat less than those that were found by me, but the upward excursion as only 34°. This latter figure certainly seems too small, in view of the fact that in but one of my cases was the range as low as this, and that in nearly all the others it fluctuated between 40° and 50°.*

From the range of excursion of the eye in various directions, we can form a tolerably close estimate of the *amount of work that each muscle does* in moving the eye.

For example, when the eye is abducted 30°-35°, its movement upwards is effected solely by the superior rectus, and, moreover, the latter is then at its maximum as an elevator. Hence, to determine the maximum elevating power of this muscle, we have only to measure the range of excursion upwards that the eye can make when abducted to this extent. Similarly, the range of excursion downwards, when the eye is abducted 30°, measures the maximum depressing power of the inferior rectus. Making use of the results

*Certainly the value of 20° found for the range of upward excursion by Hering (cited in Graefe-Saemisch) seems excessively small. It is not unlikely that here there was a pathological condition present, such as an insufficiency of one or both elevators—a phenomenon not infrequent.

already tabulated,* we find for the *maximum elevating power of the superior rectus* a value of 30° , and for the *maximum depressing power of the inferior rectus*, a mean value of 35° - 40° .

The maximum elevating power of the inferior oblique and the maximum depressing power of the superior oblique, are not so readily determined, as the eye can hardly be so far abducted as to enable these muscles to work to the greatest advantage, and at the same time do away altogether with the vertical action of the superior and inferior recti. It would appear, however, that the *maximum vertical effect exerted by the obliques*, does not differ materially from that exerted by the straight muscles; only the effect of the latter in the positions ordinarily assumed by the eye is rather more pronounced.

The *maximum rotating effect* of the superior rectus upon the vertical meridian (torsion-effect, swivel-movement) will be ascertained by determining the amount of deflection of the vertical meridian when the eye is directed far up and in. In this situation the vertical meridian is not acted upon by the other muscles capable of

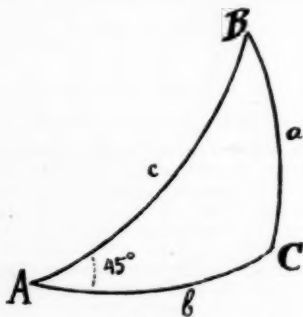


Fig. 1.

rotating it, so that the total rotation it undergoes must be ascribed to the action of the superior rectus. So, too, the rotating power of the inferior oblique, the superior oblique, and the inferior rectus is measured by the amount of tilting of the vertical meridian when the eye is directed up and out, down and out, and down and in, respectively.

The *adducting effect* of the superior and inferior recti and the *abducting effect* of the obliques are not determinable directly in the normal eye, since these actions always occur as reinforcements of the adducting and abducting actions of the internal and external recti.

*This can be accomplished by a simple calculation, based upon the principles of spherical trigonometry. Thus if AB represents the path of the visual line in passing from the primary position obliquely up and out, BC (or a) will be the elevation and AC (or b) the outward excursion or abduction of the eye. Then $\text{Sin. } a = \text{Sin. } A$. $\text{Sin. } c$ and $\text{Sin. } b = \cot A \cdot \tan. a$. Here c = the range of excursion up and out as given by our table (= about 45°), $a = 30$, and $b = 36^\circ$.

For the same reason, the total adduction or abduction that the eye is capable of is not a precise measure of the *maximum power of the external and internal recti*, since the latter are to a certain extent, assisted in their action by the vertical muscles, and particularly so when the eye is already carried pretty far out or in. It is probable, however, from observations in cases of paralysis, that the lateral action of the vertical muscles does not amount to more than 4° or 5° at most, so that the *abducting power of the externus* may be stated as 40° - 45° , and the *adducting power of the internus* as about 50° .

Passing now to the third group of functions under consideration, namely **the character and relations of the movements performed by the two eyes when working together** we are struck by the fact that, with unimportant exceptions,* these movements are limited to those subserving binocular fixation.

Thus, in order to produce the binocular fixation of distant objects, the visual lines must be parallel. In harmony with this fact, we find that there is a whole series of movements—*associated parallel movements*—in which the visual line of one eye is kept strictly parallel with that of the other; and, moreover, the vertical meridians of the two corneæ also remain parallel, no matter how the eye is directed.

A second class of movements—*movements of convergence*—adapt the eyes for the binocular fixation of near objects.

The third sort of movement is that of *divergence in the horizontal plane*, causing the eyes to pass from the consideration of a near object to that of one more remote. In doing this, this movement, like the preceding, subserves binocular fixation; but it may to a certain limited extent, also antagonize the latter by carrying the eyes still further, i. e., from a position of parallelism to one of actual divergence.

Another kind of movement, of very limited extent, is that of *divergence in a vertical plane*, produced by the elevation of one visual line and the depression of the other. This movement, called *sursumvergence* (or *deorsumvergence*) is denoted as right or left, according as the right or left visual line is higher (or lower).

*The exceptions are very clearly described by Helmholtz (Phys. Optik, 2d Ed., pp. 631, et seq.) He seems to me, however, to have laid too much stress upon the ability of the eye to make exceptional movements of this sort; the fact being that such movements are extremely limited and, beyond a certain point, cannot be increased by practice. It seems, therefore, that in spite of his statement to the contrary, there is some anatomical basis for the inability of the eye to make unaccustomed movements and that it is not simply a question of training.

A fifth class of movements comprise those in which the *vertical meridians of the two corneæ are so rotated* as to be no longer parallel. Such a rotation occurs normally in positions of marked convergence, the vertical meridians then diverging at their upper extremities, and the amount of divergence increasing as the eyes are elevated (Meissner, Le Conte). But, apart from this physiological torsion-movement, a divergent or convergent rotation of the vertical meridians may be produced in the normal eye and demonstrated by suitable apparatus (Helmholtz).

The Associated Parallel Movements of the two eyes with the muscles concerned in their production are shown in the following tables:

Both Eyes Moveto	Muscles concerned		Move eyes laterally*	Move eyes vertically*	Rotate upper end of vertical meridians of corneae.	Resultant effect upon eyes.
	R. Eye	L. Eye				
Right (Dextroversion.)	External Rectus	Internal Rectus	To R.	No action	No action	R eye carried to R by the external rectus assisted by the obliques: L. eye carried to R by internal rectus assisted by the superior and inferior recti. The other muscles act to steady the eyes and keep them in the horizontal plane. Vertical meridians both remain vertical.
	<i>Synergists.</i>					
	Superior Oblique	Inferior Rectus	{ To R, action increasing the more eyes are carried to R	[Down	[To L]	
	Inferior Oblique	Superior Rectus		[Up	[To R]	
	<i>Opponents.</i>					
	Superior Rectus	Inferior Oblique	{ [To L] action slight & diminishing as eyes are carried to R.	[Up]	[To L]	
	Inferior Rectus	Superior Oblique		[Down]	[To R]	
Left (Sinistroversion.)	Internal Rectus	External Rectus	To L.	No action.	No action.	R. eye carried to L. by the internal rectus, assisted by the superior and inferior recti: L. eye carried to R. by the external rectus, assisted by the obliques. The other muscles act to steady the eyes and keep them in the horizontal plane. Vertical meridians remain vertical
	<i>Synergists.</i>					
	Superior Rectus	Inferior Oblique	{ To L action increases the more eyes are carried to L.	[Up]	[To L]	
	Inferior Rectus	Superior Oblique		[Down]	[To R]	
	<i>Opponents.</i>					
	Superior Oblique	Inferior Rectus	{ [To R] action slight & decreases the more eyes are carried to L.	[Down]	[To L]	
	Inferior Oblique	Superior Rectus		[Up]	[To R]	
Up [Summation.]	Superior Rectus	Inferior Oblique	[To L]	Up	[To L]	Both eyes carried vertically up by combined action of superior rectus and inferior oblique. External and internal recti act to steady eye and keep it in vertical plane. Vertical meridians remain vertical.
	Inferior Oblique	Superior Rectus	[To R]	Up	[To R]	
	<i>Synergists.</i>					
	External Rectus	Internal Rectus	[To R]	No action	No action	
	Internal Rectus	External Rectus	[To L]	" "	" "	

*Portions enclosed in brackets indicate movements which are completely neutralized.

Both Eyes Move	Muscles concerned		Move eyes laterally	Move eyes vertically	Rotate upper ends of vertical meridians of cornea	Resultant effects upon eyes
	R Eye	L Eye				
Up and to R.	Superior Rectus	Inferior Oblique	[To L.] Action slight and decreasing as eyes are carried to R.	Up. Action marked and increasing as eyes are carried to R.	[To L.] Action slight and decreasing as eyes are carried to R.	R. eye carried up by superior rectus; L. by inferior oblique. R. eye carried to R. by external rectus assisted (especially in extreme abduction) by inferior oblique; L. eye carried to R by internal rectus assisted by superior rectus. Both vertical meridians tilted to R.
	Inferior Oblique	Superior Rectus	To R. Actions marked & increasing as eyes are carried to R.	Up. Action slight and decreasing as eyes are carried to R.	To R. Action marked & increasing as eyes are carried to R. No action.	
	<i>Synergists.</i>					
	External Rectus	Internal Rectus	To R.	No action.		
Up and to L.	Inferior Oblique	Superior Rectus	[To R.] Action slight & decreasing as eyes are carried to L.	Up. Action marked and increasing as eyes are carried to R.	[To R.] Action slight & decreasing as eyes are carried to L.	R. eye carried up mainly by inferior oblique. L. eye by superior rectus; R. eye carried to L. by internal rectus assisted by superior rectus. L. eye carried to L. by external rectus assisted by inferior oblique. Vertical meridians both rotated to L.
	Superior Rectus	Inferior Oblique	To L. Action marked & increasing as eyes are carried to L.	Up. Action slight and decreasing as eyes are carried to L.	To L. Action marked and increasing as eyes are carried to L.	
	<i>Synergists.</i>					
	Internal Rectus	External Rectus	To R.	No action.	No action.	
Down (Deorsum version)	Inferior Rectus	Superior Oblique	[To L.]	Down.	[To R.]	Both eyes carried vertically down by combined action of inferior rectus and superior oblique. External and internal recti act to steady eyes and keep them in the vertical plane. Vertical meridians remain vertical.
	Superior Oblique	Inferior Rectus	[To R.]	Down.	[To L.]	
	<i>Synergists.</i>					
	External Rectus	Internal Rectus	[To R.]	No action.	No action.	
	Internal Rectus	External Rectus	[To L.]	" "	" "	

Both Eyes Move	Muscles concerned		Move eyes	Move eyes	Rotate upper ends of vertical meridians of cornea	Resultant effects upon eyes
	R Eye	L Eye	laterally	vertically		
Down and to R.	Inferior Rectus	Superior Oblique	[To L.] Action slight & decreasing as eyes are carried to R.	Down. Action marked and increasing as eyes are carried to R.	[To R.] Action slight and decreasing as eyes are turned to R.	R. eye carried down mainly by inferior rectus, R. eye by superior oblique, R. eye carried to R by external rectus assisted by superior oblique, L. by internal rectus assisted by inferior rectus. Both vertical meridians rotated to L.
	Superior Oblique	Inferior Rectus	To R. Actions marked & increasing as eyes are carried to R.	Down. Actions slight and decreasing as eyes are carried to R.	To L. Action marked and increasing as eyes are carried to R.	
	<i>Synergists.</i>					
	External Rectus	Internal Rectus	To R	No action.	No action.	
Down and to L.	Superior Oblique	Inferior Rectus	[To R.] Action slight and decreasing as eyes are carried to L.	Down. Action marked and increasing as eyes are carried to L.	[To L.] Action slight and decreasing as eyes are carried to L.	R. eye carried down mainly by superior oblique, L. by inferior rectus. R. eye carried to L. by internal rectus assisted by inferior rectus; L. eye carried to L. by external rectus assisted by superior oblique. Both vertical meridians rotated to R.
	Inferior Rectus	Superior Oblique	To L. action marked and increasing as eyes are carried to L.	Down. Action slight and decreasing as eyes are carried to L.	To R. Action marked and increasing as eyes are carried to L.	
	<i>Synergists.</i>					
	Internal Rectus	External Rectus	To L.	No action.	No action.	

An inspection of the tables just given will show that in all parallel movements of the eyes each muscle acting upon the right eye is associated with a muscle which acts upon the left eye in a precisely similar manner, and to a precisely equal extent. Such a pair of muscles, one in each eye, are termed *associated antagonists* (A Graefe).

Thus the superior rectus of one eye and the inferior oblique of the other are associated antagonists, since in all positions that the two eyes may assume, these muscles move their respective eyes to the same extent and in the same direction, so that if they acted alone they would always keep both visual lines and both vertical meridians parallel. The associated antagonists and their action may be summarized as follows:

ASSOCIATED ANTAGONISTS.

MUSCLE.	Moves eye laterally	Moves eye Vertically	Rotates upper end of vertical meridian cornea	Vertical action increasing & latent action diminishing as eyes are turned to	ASSOCIATED ANTAGONIST.
R. eye.					L. eye
External Rectus	R	No action	No action		Internal Rectus
Internal Rectus	L	No action	No action		External Rectus
Superior Rectus	L	Up	L	R	Inferior Oblique
Inferior Rectus	L	Down	R	R	Superior Oblique
Superior Oblique	R	Down	L	L	Inferior Rectus
Inferior Oblique	R	Up	R	L	Superior Rectus

The determination of the *range of excursion in associated parallel movements* comprises the solution of two distinct problems, namely, the determination of the field of binocular single vision and the determination of the field of binocular fixation. We delimit the *field of binocular fixation* by ascertaining for each direction of the gaze the point at which either one of the eyes fails to follow an object moving before the two. This can be done very conveniently with the double dot used for testing the monocular field of fixation, since the moment when either eye fails to follow the dots or when either eye fails to keep up with the other in following them, is rendered evident by a blurring of the image causing the two dots to run into one.

Hering, who used a different method (with after-images), found the binocular field to be of quite small extent, being considerably smaller than the portion common to the two monocular fields.

It seems likely, however, that his tests in this case, as in the case of the monocular field, were made upon a not altogether normal subject. My own researches, although few, to be sure, were made upon quite normal individuals. They gave the following results:*

MOVEMENTS OF BOTH EYES.

	Up.	Up and right.	Up and left.	Right.	Left.	Down.	Down and right.	Down and left.
Case I.....	38	52	45	55	52	70	80	70
Case II.....	50	52	53	55	59	70	62	70

The delimitation of the *field of binocular single vision* is effected by noting in any particular direction of the gaze the point at which one eye can no longer keep pace with the other, as evidenced by the development of an insuperable diplopia.

The field defined by joining all such points is not necessarily coincident with the field of binocular fixation, since it is quite conceivable that the two eyes following a moving object might fail to fix

*Examination made for near points.

it, but might yet both lag behind to an equal extent, so that the two images, although not formed upon the maculae, would still be formed upon corresponding points. In this case, binocular single vision would still be present, although binocular fixation would no longer exist.

A point upon which some stress has been laid is that this method of delimiting the field of fixation gives uncertain results, since, as is alleged, many people fail to recognize diplopia in eccentric positions of the gaze. It is claimed, in other words, that the normal field of binocular single vision is quite small, and that diplopia occurs normally in looking far up, far to the right, etc., but that its existence is not suspected, because the subject under examination either fails to notice or actually suppresses one image. My own experiments, however, lead me to negative this idea completely. If we employ a candle for our test-object, and place a red glass before one eye of the individual examined, the *presence of binocular single vision* will be shown by the fact that the candle-flame appears pinkish or, more commonly yellow with a reddish border. *Manifest diplopia* will be shown by the presence of two flames, one red and the other yellow, and *diplopia with the suppression of either image* by the presence of one flame, either pure red or pure yellow. The differences presented are marked and readily appreciated by an intelligent patient when once they have been pointed out to him.

Testing in this way a large number of people with apparently normal eyes, I have uniformly found that the field of binocular single vision *extends not less than 40° in any given direction* and usually extends up to 50° or more. Indeed, most persons still get true binocular single vision, even when the eyes are carried to the extreme limit of their excursion, the field of binocular single vision being larger than either monocular field of fixation taken separately. This is but another instance of the law that the movements of the eyes, however extensive or however limited in themselves, are always under normal conditions modified in such a way as to best subserve binocular fixation and binocular single vision. Thus, as the experiments just adduced seem to show, it appears that, no matter what the maximum range of excursion of each eye separately is, the excursion of *both together*, effected by the co-ordinating action of the association-centres, is such that one eye keeps pace with the other, going neither faster nor slower, and that each stops moving when the other does. Hence, however far the object looked at may be carried in any given direction, no diplopia occurs, or, if it does, it is transient and superable.*

*These statements presuppose (1) that the visual lines are not far from parallel, i. e., the test-object should not be less than 3 feet from the eyes; and (2) the person examined should endeavor all the time to follow the object, i. e., must not look beyond it. In the latter case, of course, the test-object will seem to him double. Such diplopia is, however, usually at once superable by voluntary effort.

Each of the main associated parallel movements turning (dextroversion, or the turning of both eyes to the right, sinistroversion, or the turning of both eyes to the left, sursumversion, or parallel movement up, and deorsumversion, or parallel movement down) is apparently *presided over by a distinct nucleus (association centre)*. The precise location of these centres has not been satisfactorily determined, but the evidence of their existence from pathology is very strong, lesions in which dextroversion and sinistroversion alone are affected being not infrequent, and isolated involvement of sursumversion also having been recorded. These facts will be referred to later on.

Movements of convergence may be regarded as associated parallel movements to which a simultaneous contraction of both interni has been superadded. Thus in looking at a near object situated up and to the right there is a movement of sursumversion and dextroversion combined with a contraction of both interni, which neutralizes in part the right-hand movement of the right eye, and reinforces the right-hand movement of the left eye.

This double contraction of the interni is *presided over by a special centre (convergence centre)*, distinct from the association centres for parallel movements.

Convergence, when marked, modifies somewhat the effect of the other muscles that are acting with the interni. Thus when the gaze is directed at a near object in the median line, the superior rectus of one eye and the inferior oblique of the other no longer act as associated antagonists, the former serving mainly to adduct, and the latter to elevate the eye. In this case, in fact, the superior and inferior obliques in each eye neutralize each other completely, and the two superior and two inferior recti act as synergists to the two interni, all adducting the eye. Again, when the gaze is directed at a very near object, situated upward and to the right, the right superior rectus, since the right eye is not pointed as far to the right as the left one is, will not be working as an elevator at quite the same mechanical advantage as does the left inferior oblique. Theoretically, therefore, the right eye will lag somewhat below the left. Practically, I have not observed this to occur, although it does seem to me that the field of binocular single vision is smaller for convergent than for parallel movements.

The *maximum power of convergence* is obviously represented either by the angle formed by the two visual lines when both eyes are turned in to their utmost extent, or by the distance from the eyes of the nearest possible point upon which they can be converged. This point is called the *fusion near-point*, or, better the *near-point of convergence* (Pc.) Donders in a boy of 15 found the maximum angle of convergence to be 70° , which,

with an interocular distance of 60 mm., would signify a near-point of convergence situated 52 mm. from the centre of rotation of either eye and 42 mm. in front of the line joining the centres of both eyes, or about $1\frac{1}{2}$ " from the cornea and $\frac{3}{4}$ " in front of the bridge of the nose. Some can converge to even a greater extent. Prof. Le Conte, for example, who had acquired extraordinary facility in the use of his eyes, had a convergence-angle of nearly 90° . Schuurmann, on the contrary, found a maximum convergence-angle of only 43° , which would correspond to a convergence near-point situated about $2\frac{3}{4}$ " from the cornea and 22" in front of the bridge of the nose; and v. Graefe gives to the convergence-angle a value of 60° corresponding to a distance of 2" from the eye, and $1\frac{1}{2}$ " from the bridge of the nose. My own experience leads me to regard Schuurmann's figures as expressing most nearly the results found in the general average of cases, the convergence near-point in the majority of normal persons that I have examined being situated at about 2" in front of the nose. A distance of $1\frac{1}{2}$ "-2" may, in fact, be regarded as the normal for adults. Children often have a greater power of convergence, and in them the distance may not exceed 1". A distance of less than 1" denotes excessive, and one of over $2\frac{1}{2}$ " deficient convergence-power.

Another method of determining the power of convergence is by ascertaining the *strength of prism*, which can be overcome by the eyes when placed before the latter with its base out or towards the temple.

This method is analogous to that employed by Donders for determining the positive portion of the range of accommodation. The strength of prism overcome, in fact, represents the amount of *residual convergence** that the subject under examination can exercise when his eyes are adjusted for the distance of the test-object employed, just as the strength of the concave glass that he can overcome represents the amount of his *residual accommodation* under the same conditions. The amount of this residual convergence naturally varies with the distance of the test-object, decreasing as the latter is brought nearer. It also varies considerably for the same distance in different individuals, until the latter have by training learned to do what at the outset is quite difficult for them, namely, to look at a distant object and at the same time direct their eyes as if it were much nearer than it really is. When this art has been learned, it will be found that,

Normal subjects will for test-objects at a distance of twenty feet overcome prisms of 60° - 70° refracting angle (equivalent to a convergence of 40° - 50°), so that the maximum convergence produced in this way equals that produced in the natural fashion, i. e., by looking at a very near object.

*Often improperly called the adduction.

Convergence thus produced by prisms is at first associated with an *accommodative effort* similar to, but less than that accompanying a natural convergence of the same degree. Thus two cases that I examined showed the following amount of accommodation:

	Actual amount of convergence produced by overcoming the prism.	Accommodation exerted.	Corresponding amount of accommodation for a natural convergence of the same degree.
Case 1....	4.3°	0.25	1.25
	6.5°	0.50	2.00
	11.00°	1.50	3.25
Case 2. ..	15.5°	2.50	4.50
	19.3°	5.00	5.50

By continual practice, however, the patient may learn to relax the accommodation while maintaining the convergence, and in this way prisms of 20° or 30°, base out, may be overcome without the accommodation being used at all. I have met with an extreme instance of this sort in which the patient could, without making any accommodative effort whatever, overcome prisms representing a convergence-angle of nearly 40°.

Divergence, or the simultaneous lateral separation of the visual lines, is a process which ordinarily subserves binocular fixation, being used when the eyes fix in succession objects more and more remote. The process may, however, be performed to excess, so that the visual lines diverge from the object of fixation, as when the homonymous diplopia caused by a prism placed base in before the eye is overcome, or, on the other hand, an involuntary or voluntary crossed diplopia is produced by turning the eyes outward.

Divergence of the sort last mentioned, i. e., that giving rise to a crossed diplopia, varies greatly in amount, and, although regarded as normal by those experimenters who have acquired a peculiar facility in producing it, is probably to be classed among the abnormalities. At all events, there are not many in whom the phenomenon is habitual, or who can produce it at will, and when present, it is generally associated with lack of muscular balance, and other evidences of a pathological state.

On the other hand, a divergence produced in the act of overcoming a prism placed, base in, before the eyes, is an entirely normal phenomenon of very definite character. Its maximum amount naturally varies with the distance of the object of fixation, increasing as the latter approaches the eye. The strength, in fact, of the prism, base in, that the eyes can overcome when regarding an object at any given distance, represents the amount by which the eyes, when converged upon the object and accommodated for the latter, can diverge; just as the strength of the

convex glass that can be overcome in looking at the object represents the negative portion of the range of accommodation for the same distance. For distance, i. e., when the visual lines are parallel, the divergence* amounts quite regularly to from 3° to 5° (= divergence produced in overcoming a prism of 6° to 10°); and variations above or below these limits must be regarded as distinctly pathological.

As to the *true nature of divergence*, i. e.; whether it consists in an active muscular contraction as in the case of convergence, or whether it is simply a relaxation of the interni, allowing the eyes to return to a position of rest, there has been much difference of opinion.

Those who adopt the latter view assume that the natural position of the eyes, i. e., that in which all the muscles are fully relaxed, is one of slight divergence, parallelism itself requiring a certain tonic and constant contraction of the interni for its maintenance (Hansen Grut). Some have even thought that the position of complete relaxation is that in which each visual axis coincides with the axis of the orbit—a state of things implying a divergence of 25° - 30° (Le Conte). Those who thus think, however, appear to be misled in regarding as natural a condition which is abnormal, not to say pathological. Schweigger has argued strenuously against Hansen Grut's theory and especially to his application of it as explaining the nature of divergent squint, and Schneller also has adduced a variety of arguments, which, however, are not very convincing, to prove that the function of divergence is an active process. For my own part, I believe that in the majority of cases the position of perfect physiological rest is not one of divergence and that, consequently, the lateral separation of the visual lines must be regarded as, in part at least, an active process due to simultaneous contraction of the externi. One argument in favor of this is that many people, when we test their divergence with prisms, experience a marked sense of strain analogous to that felt in overcoming prisms by converging the eyes. The latter is certainly an active process, and the former, therefore, in these cases at least, would seem to be one also. Patients, to be sure, who can diverge at will so as to produce crossed diplopia, often assure us that they do so by "relaxing" the eyes; but several observations have convinced me that this relaxation is really a muscular contraction.*

Perhaps the strongest argument in favor of the idea that divergence is a passive and not an active process is that, in the great majority of cases at least, the *diverging power, as measured by the ability to overcome prisms, base in, can not be increased at all beyond the initial amount, shown by the subject experimented upon*. If, for example, in our first trial of a patient, at the maximum prism, base in, that he can overcome is one of 8° , we shall generally find

*Usually but improperly called the abduction.

*A similar instance in which an undoubted muscular contraction was described by the patient as a "relaxation" was one that I met with, in which an homonymous diplopia of 15° (prism) was produced at will. Here, of course, a condition of convergence was present, which could only have been brought about by an active contraction of the interni.

that we can not get him beyond this point by any amount of subsequent training. If divergence were a process of active muscular contraction it would seem as if it ought to be susceptible of being increased by exercise.

But whatever the nature of divergence, whether active or passive, it is certainly a distinct function of the eyes, and probably regulated by a distinct nervous mechanism. The evidence afforded by pathology, at all events, point very strongly in this direction.

Separation of the visual lines in a vertical plane (**sursumduction**, or, more properly, **sursumvergence**) is a movement which all normal eyes can perform. It is, however, very limited in amount, not normally exceeding 1° or $1\frac{1}{2}^\circ$ (= the divergence produced by a prism of 2° or 3°). It is evidently an active process associated with a sense of considerable strain, and appears susceptible of being increased by exercise, particularly in those that have a natural or acquired vertical deviation (hyperphoria).

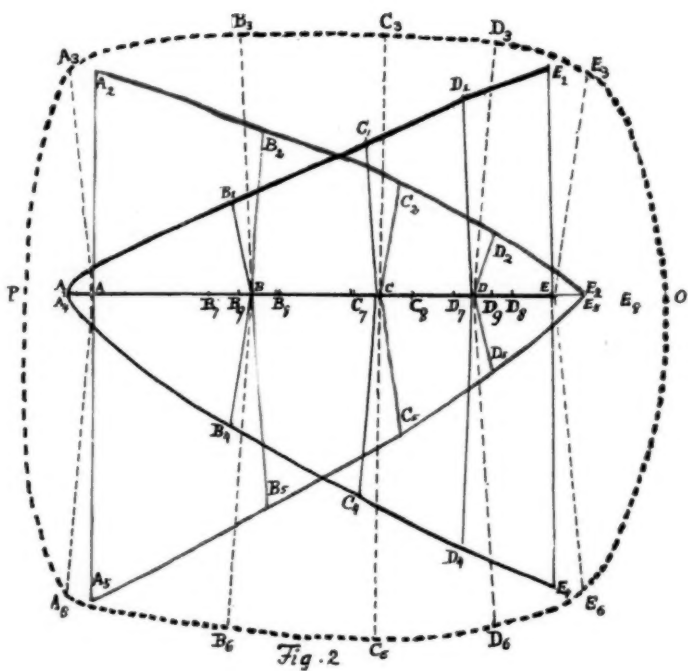
The power of producing **convergence or divergence of the vertical meridians** of the two eyes, the visual lines remaining parallel, is a subject about which very little is known. Even the experiments of Helmholtz, which seem to prove its existence, have been called into question by some, although probably without sufficient reason.

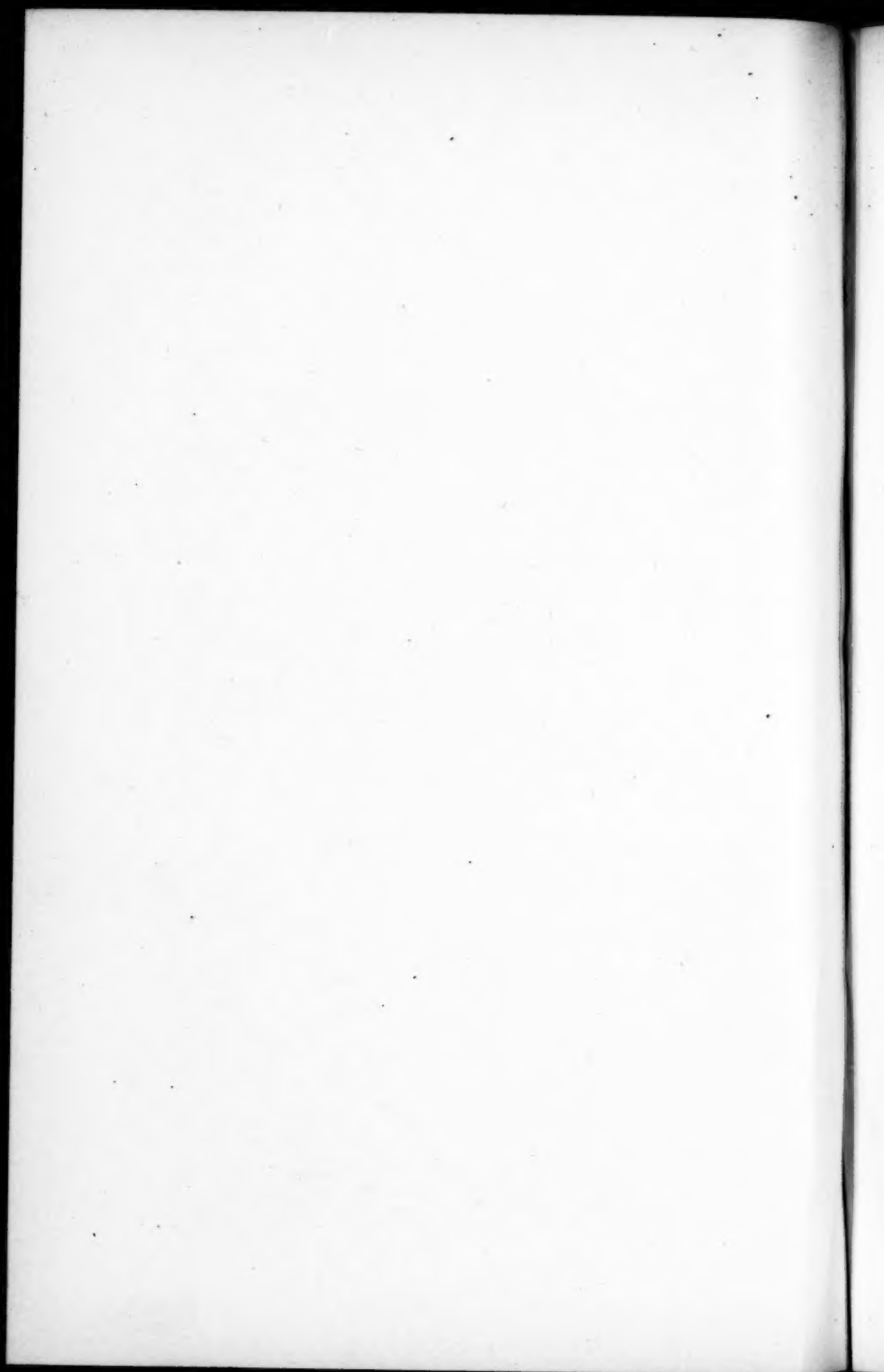
APPENDIX. The analysis of the complicated problems involved in the study of the movements of the eyes may be facilitated by reference to the diagram (Fig. 2), which represents the field of fixation of a normal eye having a rather extensive power of motion.

PROJECTION OF THE FIELD OF FIXATION AND OF THE FIELD OF ACTION OF EACH OF THE OCULAR MUSCLES.

C, projection of extremity of line of sight (point of fixation), when eye is in primary position; D, E, O, projection of same when eye is abducted 18° , 30° , and 50° , respectively; B, A, P, projection when eye is adducted 20° , 50° , and 60° , respectively. The distance CO, represents the maximum degree of excursion of the eye outward. Most of this movement is effected by the *external rectus*, but a certain portion especially towards the outer end of the excursion is accomplished by the united action of the two obliques (see *infra*). The distance CP, represents the maximum range of excursion of the eye inward. This inward movement is effected mainly by the *internal rectus*, assisted especially towards the end of the excursion by the superior and inferior recti (see *infra*).

The black lines AA₁, BB₁, CC₁, DD₁, EE₁, represent the amount and direction of the movement produced by the *superior rectus* when the eye is respectively adducted 50° (A); adducted 20° (B); in the primary position (C); abducted 18° (D); and abducted 30° (E). The red lines AA₂, BB₂, CC₂, DD₂, EE₂, represent the amount and direction of the movement effected by the *inferior oblique*, and the dotted lines AA₃, BB₃, CC₃, DD₃, EE₃, the movement effected by the in-





ferior oblique and the superior rectus acting together. Similarly, the black lines $AA_4BB_4CC_4DD_4EE_4$ represent the lines of action of the *inferior rectus*; $AA_5BB_5CC_5DD_5EE_5$, those of the *superior oblique*; and $AA_6BB_6CC_6DD_6EE_6$, those of the two latter muscles combined. The heavy black lines $A_1B_1C_1D_1E_1$ and $A_4B_4C_4D_4E_4$ represent the limits of the *fields of action* of the superior and the inferior recti; and the heavy red lines, $A_2B_2C_2D_2E_2$ and $A_5B_5C_5D_5E_5$ the limits of the fields of action of the inferior and the superior obliques. The heavy dotted line $A_6PA_6B_6C_6$, etc., represents the limit of the *field of fixation*.

It will be seen from the diagram how the *vertical* (elevating and depressing) action of the superior and inferior recti increases, and how the vertical action of the obliques decreases progressively as the eye is carried from a position of marked adduction (A) to one of moderate abduction (E). It will also be apparent how the *lateral* action of each of these muscles diminishes as its vertical action increases; so that the adductive power of the superior and inferior recti shows a progressive diminution, and the abductive power of the two obliques a progressive increase as the eye passes from A to E. That is, at A (i. e., when the eye is adducted 50°) the superior and inferior recti have no vertical action at all, but simply adduct the eye through a comparatively large extent, while the two obliques have no lateral action at all, but simply elevate and depress the eye.

At E, on the other hand (when the eye is abducted 30°), the two recti no longer act as adductors at all, but simply elevate and depress the eye; and the two obliques no longer exert any vertical effect, but combine to carry the eye outwards, their abductive action, in fact, being here at its maximum.

At A the *superior rectus* and the *inferior oblique* acting together to their full extent will carry the eye up and noticeably inwards (to A_3); since here the adductive action of the rectus is at its maximum and besides is not balanced by any opposing abductive action on the part of the oblique. Similarly at E the two muscles acting together will carry the eye upwards and noticeably outwards. In intermediate positions, as at B and D, the lateral action of one muscle will partially counteract that of the other, so that the net lateral effect will be less. E. g., at B the adductive action of the superior rectus is less than it was at A and moreover is now opposed by a moderate abductive action on the part of the inferior oblique, so that the net adductive effect is but slight. The eye, therefore, here is carried up by the inferior oblique, assisted somewhat by the superior rectus, and is also carried slightly inwards (to B_3). At D, on the contrary, it is carried upwards mainly by the superior rectus, assisted somewhat by the inferior oblique, and is also carried slightly outwards (to D_3), by the preponderating lateral (abductive) action of the latter muscle. At C (the primary position) the adductive action of the superior rectus apparently balances the abductive action of the inferior oblique, and hence the effect of the two elevators acting together will be to carry the eye straight upwards.

In a similar way the *inferior rectus* and the *superior oblique* acting together will carry the eye down and in (AA_6BB_6), down and out (DD_6EE_6), or straight down (CC_6), according as the eye is already adducted, abducted, or in the primary position.

The *superior or inferior rectus* acting together with just sufficient force to neutralize each other's vertical action, will combine to adduct the eye, the adductant effect being forcible at A ($=AA_1+AA_4$ or AA_7), and diminishing gradually to E where it is zero. At E, therefore, i. e., when the eye is abducted 30° , the inferior and superior

recti acting together will produce no movement and hence in this position are direct antagonists.

Similarly the *superior and inferior obliques acting together* neutralizes each others' vertical action, but combined to abduct the eye. The abducent effect is greatest at E ($= EE_2 + EE_6 = EE_8$), and diminishes progressively to A, where it is zero. In the latter position, therefore, i. e., when the eye is abducted 50° , the two obliques, acting simply to elevate and depress the eye respectively, are direct antagonists.

The four muscles, *superior and inferior recti and superior and inferior obliques acting together* with the force required to neutralize each other's vertical action, will produce a lateral effect varying with the amount by which the eye is already abducted or adducted. Thus if the eye is already adducted 50° (to A), a position in which the obliques exert no lateral action at all, the total effect of the four muscles will be to carry the eye quite a little distance further inward (to A₇). If the eye is adducted only 20° (B), the resultant action of the four muscles will be the difference between the adductive action of the two recti (BB₇), and the less marked abducent action of the two obliques (BB₈); i. e., the eye will be adducted slightly (to B₉). At C (the primary position), the abducent action of the obliques balances the adducent action of the superior and inferior recti, so that the contraction of the four muscles will cause the eye to remain stationary. At D, on the contrary, the abductive effect will preponderate somewhat, and the eye, already abducted 18° , will be carried still further moderately outwards (to D₉). At E, i. e., when the eye is abducted 30° , the abducent effect is still more pronounced ($= EE_8$).

It is thus apparent that if all four muscles act together they will, if the eye is being adducted or abducted, *tend to carry it still further in the direction in which it is going*. They will, therefore, reinforce the external rectus in abducting and the internal rectus in adducting the eye, and the amount of the reinforcement will increase in proportion as the eye is already abducted or adducted. So that the internal rectus, for example, when it begins to contract (i. e., is just leaving the primary position at C) will receive little or no aid from the contraction of the other four muscles, but, as it continues to act, (e. g. at B), will be more and more assisted by them, and finally when it reaches the limit of its contraction (at A) and is consequently working at a great mechanical disadvantage, will be strongly reinforced. In like manner the external rectus will, as its own efficiency diminishes with the increasing abduction of the eye, be assisted more and more by the simultaneous contraction of the other muscles. And it is altogether probable that it is in this way that the outward and inward excursion movements of the eye are rendered regular and uniform.*

*It may be noted that the action of the superior and inferior recti in compensating for an increasing feebleness of the internal rectus is shown in another way also. The internal rectus, as Weiss has pointed out (Arch. f. Augenhelk; Vol. xxix), acts very much more feebly when the divergence of the orbits is great, i. e., when the orbits are shallow and the eyes far apart. But it is under just these conditions that the superior and inferior recti act to most advantage as adductors, since, the greater the divergence of the orbits, the greater the angle which the line of action of these two muscles makes with the antero-posterior axis of the eye, and the greater consequently is the lateral effect which they are able to exert.

Our diagram may also be used to illustrate the action of the *associated antagonists*. If alongside of Fig. 3, which represents the field of fixation of the right eye, we place one representing the field of fixation of the left eye (which may be done by turning Fig. 3 end for end, so that O is on the left and P on the right of the figure), we shall see how the field of action ($A_2B_2C_2D_2E_2$), of the inferior oblique of the right eye agrees in all respects with the field of action of the superior rectus of the left eye. So also of the other associated antagonists (R. superior rectus and L. inferior oblique; R. inferior rectus and L. superior oblique; R. superior oblique and L. inferior rectus).

Another point elucidated by the diagram is the amount and kind of *torsion movement* (rotation of vertical meridian of the cornea) produced by the various muscles. That is the line BB_1 represents the fact that when the eye is adducted to B the superior rectus will not only carry the eye itself upwards and inwards (to B_1), but will also rotate the vertical meridian of the cornea so that the latter will have the inclination BB_1 , i. e., will be inclined inwards. In a similar way, the inferior oblique in the same situation will not only carry the eye upwards and outwards (to B_2), but will also rotate the vertical meridian of the cornea outwards, so that it will have the direction BB_2 . And the combined action of the two muscles will be to give the vertical meridian the inclination BB_3 , i. e., one of slight rotation inwards. So also BB_4 represents the inclination of the vertical meridian of the cornea (viz., with the upper end rotated inwards), when the eye is carried downwards from a position of adduction (B). Again, the fact that CC_3 is strictly vertical shows that when the eye is in the primary position it is not only carried straight upwards by the combined action of the two elevators, but its vertical meridian also remains vertical during the ascent.

It will also be observed that the combined action of the superior and inferior recti or of the superior and inferior obliques, or of all four muscles together will be not only to keep the eye in the horizontal plane (in the line OP), but also to keep its vertical meridian from rotating either to the right or to the left, as the eye is carried outwards or inwards.*

In fact, all the various applications of the laws of Donders and Listing may be deduced from the study of this diagram.

Finally the diagram shows the *limitation of the field of fixation and the kind and amount of diplopia present in paralysis* of any one of the ocular muscles. Suppose, for example, that the superior rectus is paralyzed. Then the field of fixation while normal below, will, since the inferior oblique is the only elevator left, be represented above not by $A_3B_3C_3D_3E_3$, but by $A_2B_2C_2D_2E_2$. In other words, when the attempt is made to elevate the eye as far as possible, it will stand at A_2 , instead of A_3 , at B_2 , instead of B_3 , etc. Since its fellow eye has a normal field of fixation and hence under the same conditions rises to A_3 , B_3 , etc., the difference in position of the two eyes and consequently also the amount and kind of diplopia produced will be represented by the difference between A_2 and A_3 , B_2 and B_3 , etc. The diagram thus gives us a graphic representation of the fact that in paralysis of the

*E. g., at C the inward rotation of the vertical meridian produced by the superior rectus will be represented by the angle C_3CC_2 ; this inward rotation will be neutralized by the equal outward rotation C_6CC_4 , produced by the inferior rectus; and hence the combined effect of these two muscles will be to keep the vertical meridian from rotating either one way or the other.

superior rectus the vertical diplopia increases rapidly when the eye is carried upwards and outwards, while the lateral (crossed) diplopia increases as the eyes are carried upwards and inwards.

The diagram may also be utilized to map out the field of fixation in cases of *combined paralyses*. Thus the field of fixation in a case of paralysis of both the superior rectus and the superior oblique would be represented by $A_2B_2C_2D_2E_2F_2G_2H_2I_2J_2K_2L_2M_2N_2O_2P_2Q_2R_2S_2T_2U_2V_2W_2X_2Y_2Z_2$; and in a combined paralysis of the superior and inferior rectus by $A_2B_2C_2D_2E_2F_2G_2H_2I_2J_2K_2L_2M_2N_2O_2P_2Q_2R_2S_2T_2U_2V_2W_2X_2Y_2Z_2$.

III.

THE TESTS EMPLOYED AND THEIR SIGNIFICANCE.

The *object* of the various tests that we make use of is to determine the following data:

- (1). The precision and steadiness with which binocular fixation is effected (Static Tests).
- (2). The ability of the eyes to move in various directions while still maintaining binocular fixation (Dynamic Association-tests).
- (3). The ability of the eyes voluntarily to deviate from the position of binocular fixation (Dynamic Disassociation-tests).

These tests may be performed both for distance (with the visual lines parallel) and for near (with the visual lines converged).

The chief tests for *binocular fixation* are:

- (1). **Inspection with both eyes uncovered.** This gives us an approximate idea as to whether both eyes are directed at the same object, a non-fixing eye appearing to deviate in, out, up, or down, according to circumstances.

In making this test we must be careful not to be misled by the presence of a large angle (Δ), which may simulate a deviation where none exists. Any error on this score will be prevented by comparing the findings with those of the screen test, for a deviation, great enough to be noticeable upon simple inspection, will certainly give evidence of its presence by a distinct movement of the eyes when the cover is shifted from one eye to the other.

- (2) **Fixation and Diplopia Tests.** A patient with normal eyes and perfect binocular fixation, will see distinctly with either eye alone, or with both together, and will also see single. If either eye or both fail to fix the object looked at, that object will appear blurred (*Fixation-test*), and if one eye fixes and the other does not, the patient will in general see double (*Diplopia-test*), the image of the fixing eye being clear and that of the other more or less shadowy and indistinct. The kind of diplopia present indicates the nature of the deviation. Thus an *homonymous diplopia* (i. e., one in which the image formed by the right eye is on the right side, and that formed by the left eye on

the left side) signifies abnormal convergence of the visual lines; a *crossed or heteronymous diplopia* (in which the image of the right eye is on the left side and vice versa) signifies lateral divergence; and *vertical diplopia* (in which one image is higher than the other) signifies vertical separation of the visual lines, so that one is higher than the other. The last-named variety may be further differentiated into *right diplopia*, in which the image formed by the right eye is below (indicating the condition in which the right visual line is the higher), and *left diplopia*, in which the contrary conditions prevail.

The amount of diplopia is precisely proportional to the amount of deviation. It may be measured either by estimating the linear distance between the two images, the distance of the object looked at being also known,* or by determining the strength of the prism which appropriately placed, will correct the diplopia.†

In order to differentiate the double images it is convenient to use a light as a test-object, and have a red glass placed before one of the eyes. By thus giving the two images a different color‡ we enable the patient the better to distinguish between the two and recognize the fact that diplopia exists; and, moreover, since the red flame must belong to the eye covered with the red glass, we can determine from the patient's statements as to the relative place of the red and white images, whether we are dealing with homonymous or crossed (lateral) or with right or left (vertical) diplopia.

(3) **Equilibrium Test.** This is simply a variety of the diplopia test. It consists of two steps. In the first an artificial homonymous diplopia is produced by means of a prism of 12° or more, placed base in, before the eyes. If the two images thus produced are on a level, the visual lines themselves are on a level. If, however, the right-hand image should be lower, there is really a natural right diplopia present in addition to the artificial homonymous diplopia, i. e., the right visual line is lower, or, to use Stevens' nomenclature, there is right *hyperphoria*. The amount

*A linear distance of 1" between the images is equivalent to a deviation of $1\frac{1}{2}^\circ$ in the visual lines when the test-object is 1 metre distant and to $\frac{1}{4}^\circ$ when the latter is 20 feet distant.

†A prism rarely measures the full amount of the diplopia, as a prism which slightly undercorrects the latter nevertheless brings the double images so close together that the residual correction can be and is effected by the eyes themselves.

‡A similar difference in character may be imparted to the images by placing a Maddox rod or a Stevens' sphere before one eye; but the red glass is simpler and, in comparison with the Maddox rod at least, is less confusing to the patient and less apt to give ambiguous results.

of this latter may be measured by the degree of prism, which, placed base down before the right eye, will rectify the diplopia, i. e., will bring the images on a level. In the next step of the test, a strong prism is placed base down before the right eye, producing a marked vertical (left) diplopia. If both eyes are properly adjusted for the object of fixation, the two images will be in a vertical line. If, however, the upper image is to the right of the lower, there is really, besides the artificial vertical displacement, a natural homonymous diplopia, or, to use Stevens' expression, there is an *esophoria*. Similarly, if the upper image is to the left of the lower, there is really a crossed diplopia or *exophoria*. In either case the amount of the esophoria or exophoria may be measured by the strength of the prism which, placed base out or base in will rectify the diplopia, i. e., will bring the two images into a vertical line.

In Stevens' phorometer, which is the best instrument for this purpose, the measurement of the deviation is effected, not by placing additional prisms before the eyes, but by revolving the prism that has been used to produce the initial lateral or vertical diplopia until the images are truly horizontal or vertical. The amount of rotation is read off on an arc graduated so as to indicate directly the amount of hyperphoria, esophoria, or exophoria present.*

One defect of the equilibrium test is that patients often try involuntarily to bring the two images into line and thus appear to have no deviation of the visual lines, although one actually exists. On the other hand, the involuntary movements set up in the attempt made to compare two similar images placed at a distance from each other may cause a deviation to be simulated where none is present. I have seen this occur not infrequently—sometimes to a very marked degree. The equilibrium test being thus apt to set up a certain amount of muscular tension and hence disturb the true relation of the visual lines, is in actual practice best performed after the tests next to be described in which the eyes are under more normal conditions.

(4) **Screen Test.** This depends upon the fact that the tendency to binocular fixation is so strong that it still persists, even when one eye no longer sees the object of fixation. If, therefore, a card be placed before the left eye, and the gaze be directed at a distant object, the left eye will, in case there is no disturbance of innervation causing it to deviate, look straight at the object, just as if the latter were still visible. If now the card is shifted from the left eye to the right, the former being already properly directed, will not have to change position in order to fix the ob-

*The same thing may readily be done with the ordinary trial-frame, if we use in it a 12° prism and recollect that with this each rotation of 5° from the horizontal represents 1° of hyperphoria, and each rotation of 5° from the vertical 1° of esophoria or exophoria.

ject, and will hence remain stationary. If, however, the left eye when screened, deviates in any way, e. g. outward, it will, when the screen is transferred to the right eye, have to turn inward, or to the right, in order to fix the object, and the amount of its excursion inward (*movement of redress*) will be precisely equal to the amount of its previous deviation. At the same time that the left eye turns inward, or to the right, in order to perform fixation, the right eye, which is now covered by the card and which, according to the law of associated parallel movements, receives an impulse to move to the right equal to that communicated to the left eye, will move outward.

Whether it moves outward to the same extent that the left eye moves in or not, depends upon the relative ability of the muscles of the two eyes to respond to the stimulus imparted to them. If, for instance, the left internus is weak (paretic) a very strong impulse will be required in order to make the muscle contract enough to cause the eye to move in to the proper extent. According to the law of association, an equally powerful impulse will be communicated at the same time to the right externus; and, if the latter is normally strong, it will respond much more efficiently to this impulse than did the weak internus of the other eye, and will, consequently, carry the right eye out much further than the left eye was carried in.

It may be stated as a general rule (to which, however, there are not a few exceptions) that in concomitant deviations the deflection behind the screen, and hence also the movement of redress that the eye makes when the screen is removed, are equal for the two eyes, and that in non-concomitant deviations they are unequal, being greater in the eye which has the more powerfully acting muscles.

The screen test may also be used to ascertain *which of the two eyes habitually fixes*.

In doing this the screen instead of being shifted from one eye to the other is simply removed from the eye before which it is placed, leaving both eyes uncovered. Each eye under these circumstances will deviate when the screen is in front of it, and the other eye will fix. If now the eye that is behind the screen is the one that in binocular vision is regularly employed for fixation, it will move into the position of fixation as soon as the screen is taken away, and the other eye will deviate. If, however, the eye that is behind the screen does not ordinarily perform fixation, it will not move when unscreened, and the other eye will continue to fix, i. e., will remain steady in its place. That is, the fact that the eyes perform a movement of redress when the right is unscreened and both are left open indicates that the right eye habitually fixes. If no movement takes place, when the right eye is unscreened, the latter can not be the eye that habitually fixes; and if no movement takes place when the right eye and the left alternately are unscreened, there must be an alternating deviation, i. e., one in which either eye indifferently is used to fix with.

The *amount* of deviation behind the screen, or of the movement of redress made by the eye from which the screen has been removed, may be roughly estimated by marks made upon the lids or may be more accurately determined with the perimeter or by some of the various strabometric methods which have been well described by Maddox (*Archives of Ophth.*, XXI., 1, 1892). An angular deviation of 1° - 2° is generally sufficient to produce a noticeable deviation behind the screen.

Finally, it must be noted that the screen test is *valueless unless the patient can be got to fix with the uncovered eye*. Hence, the test is of no service in those who, owing to a deviation of long standing, have lost the power of fixation; and it may likewise prove nugatory in children who fail to keep their gaze directed at the object that they are told to look at.

(5) **Parallax Test.** When the screen test is employed, the patient, if his eye deviates behind the screen, will in general notice a movement of the object whenever the screen is shifted. This movement is called the *parallax*, and, if the test-object is so placed as not to be projected upon any surface back of it (e. g., if it is a spot upon a blank wall), furnishes a valuable indication of the amount and character of the deviation. The perception of this movement is really nothing but the perception of a diplopia, which differs from ordinary diplopia in the fact that the *two images are seen in succession, instead of at the same time*, and, as they occupy different places, give the impression of a single image which has moved from one place to another. Thus, if there is convergence (esophoria), the right eye, when unscreened, and before it has had a chance to assume the position of fixation, sees the object a little further to the right than the left eye saw it, i. e., the object appears to have moved from left to right (*homonymous parallax*). If, on the other hand, there is divergence (exophoria), the right eye will when unscreened see the object a little further to the left than the left eye did when it was fixing, i. e., the object appears to have moved from right to left (*crossed parallax*). So, too, right hyperphoria is indicated by the fact that the object appears to move down when the right eye is uncovered (*right parallax*), while in left hyperphoria the object seems to move up (*left parallax*). These various movements are noticeable even when the deviation is very slight; a hyperphoria of 1 - 10° , for example, being made appreciable by a distinct up and down movement of the object.

The *amount* of the parallax may be measured by the strength of the prism which, placed before the eyes, will neutralize the

movement. Homonymous parallax will be neutralized by a prism base out, a vertical parallax by a prism with the base up or down, etc. The fact of neutralization or reversal is generally indicated by the patient with great precision.

Tests for the Associated Parallel Movements. The ability of the eyes to perform associated parallel movements, i. e., *the range through which they can move in any direction and still carry on binocular fixation*, is tested in the same way as the ability to maintain binocular fixation while in the primary position. All the tests just described are applicable. Thus inspection enables us to say whether the movement of the eyes in, out, up, or down, is too slight or too excessive; also the point where one eye ceases to keep up with the other, this being shown by the fact that the former visibly lags behind or wavers in its course. In this way we may map out the *monocular or binocular field of fixation*, as may also be done more accurately by the fixation test (with the double dot, as already described). So, too, by the diplopia test we map out the *field of binocular single vision*, and thus also determine whether the eyes follow each other to a normal extent or not. With the same object in view we apply the screen, parallax, and equilibrium tests to ascertain if there is any visible deflection, parallaxic movement, or heterophoria within the limits of the normal field of fixation, and, if so, where they begin, and in what direction they increase.

By these various means we determine *whether the movements in any given direction are excessive or restricted*. In this regard, inspection and the diplopia and screen tests are practically the most applicable. The mapping out of the field of fixation is laborious and, for the reasons already given, the results obtained are very uncertain, unless a series of examinations upon the same patient happen to be quite concordant.

On the other hand, the diplopia test is readily applicable, and in my experience gives much more constant and reliable results. Diplopia may, to be sure, occur normally, as a transient phenomenon (*physiological diplopia*) in most people when the gaze is carried far towards the periphery of the field of fixation; but such diplopia, as already stated, is inconstant and superable by voluntary effort. A diplopia occurring under all circumstances as soon as the gaze has been carried from 35° to 40° from the primary position, in any given direction, indicates an abnormal weakness. This again may be temporary, and a diplopia of this sort occurring about equally far in all directions from the periphery (*concentric contraction of the field of single vision*)

indicates a temporary enfeeblement of all the ocular muscles such as may happen in neurasthenia and form one of the evidences of a general depression of the muscular forces. On the other hand, a diplopia, insuperable by voluntary effort and constantly occurring as soon as the gaze is carried 30° or less in any given direction from the primary position, indicates a true weakness or paresis, of some one of the ocular muscles (*paretic diplopia*). The differential diagnosis of this condition, based upon the character of the diplopia, will be touched upon later.

Tests for Convergence. The tests for *binocular fixation* in convergence are the same as those for distance, namely, inspection, the fixation and diplopia tests, the screen and parallax tests, and the equilibrium test. All of these, in fact, are habitually applied with the test-object held at the ordinary reading distance, as well as at a distance of 20 feet. The test-object itself for the examination at near points should, as Randall has well said, be something requiring accurate fixation (e. g. a pen-point or fine dot, instead of the finger which is habitually used). In determining the parallax, some device such as a dot on a large card, which does not allow the test-object to be projected upon any surface beyond it, should be employed.

It must be borne in mind that, while orthophoria—absence of deviation—is the ideal state for distance, a *slight amount of divergence is physiological for near*. Thus, in testing at 12", we expect to find with the phorometer an exophoria of 3° to 6° , and with the screen a crossed parallax of the same, or a somewhat less amount; and orthophoria at this range is actually to be regarded with suspicion, as probably indicating an undue tendency to convergence. This fact does not militate against the existence in these cases of true binocular fixation for reading, or other occupations requiring precise adjustments.

The tests for the associated movements in convergence, likewise are made in the same way as for the associated movements at a distance. In making the diplopia test at near it is best, if using the candle, to hold the latter not less than 30" from the eyes, so as to reduce as much as possible the effects of projection. If it is desired to determine the field of binocular single vision for closer ranges, the effects of projection may be obviated by using for a test-object a dot on a large card, the latter being tilted so as always to be perpendicular to the patient's line of sight.

A further important fact to determine in testing movements of convergence is the *convergence near-point* (Pc). This is ascertained by carrying a fine object nearer and nearer to the eyes, un-

til the latter can no longer be converged upon it, or until it appears double. The distance of the object from the root of the nose may then be measured. Notice at the same time should be taken as to which eye is the first to deviate when the limit of convergence is reached. The same test should be repeated from either side, the object of fixation being first placed at some point A to the right of the middle line and then carried directly towards the left eye L. The latter obviously will not have to change its position of adduction, but the right eye, R, in order to follow the object, must swing inwards through a considerable arc, A C P. If, on repeating the test with the left eye, one of the two is found

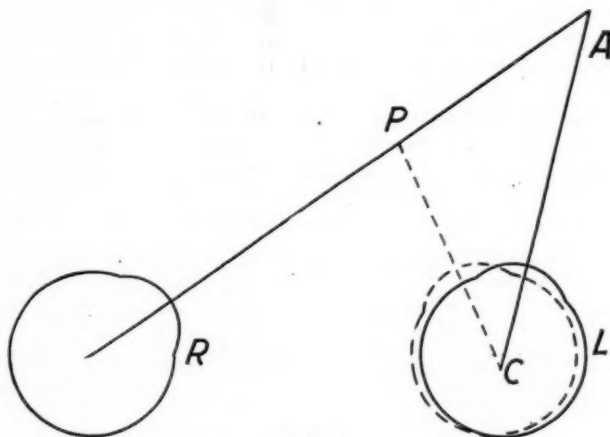


Fig. 3.

to sag off from the test-object much sooner than the other eye does, the former must have a relatively weak adducting power.

Not only the distance of the convergence near-point, but also the *ability of the eyes to maintain convergence* at this distance, should be noted.

Lastly, the convergence must be tested by determining the maximum *strength of prism placed base out* before the eyes, which the latter can overcome when looking at a distant object. Usually, if the patient can at the outset overcome a prism of 20° refracting angle, with ease, we assume that he could readily learn to do two or three times as much if sufficiently exercised, and we consider his prism-convergence as normal. Exceptionally, especially in cases of convergence-insufficiency, we find that the

prism-convergence even after repeated trials cannot be got above 10° or 12° (prism), and that even this amount is hard for the patient to do and still harder to maintain.

As the exercise of the prism-convergence not infrequently begets a condition of convergence-spasm, it is generally best to defer testing the convergence in this way until after the divergence has been determined.

It is well in testing the convergence by means of adducting prism to *ascertain how much accommodation* the patient is associating with it. This can be done by using the test-types for the object of fixation and finding what concave glass is required to give the patient full sight. It will generally be found that by repeated practice with an object of this sort, the strength of the concave glass can be gradually diminished—i. e., the patient gradually acquires the ability, when looking at a distant object, to converge without using his accommodation. A case in which extreme facility in this respect was acquired has already been spoken of. It is often important therapeutically to effect a disassociation of this sort between accommodation and convergence; especially in cases of convergence-insufficiency.

Tests for Divergence. The diverging power is determined by the amount of prism placed, base in, before the eyes, which the latter can overcome when looking at a distant object. The strength of prism thus overcome varies in normal cases from 6° to 8° (refracting angle). A divergence of less than 5° (prism) means insufficiency, and one of over 9° an excess of diverging action.

Tests for Sursumvergence. The sursumvergence, i. e., the amount by which the eyes can diverge in a vertical plane, is determined by the strength of prism placed base up or down before the eyes, which the latter can overcome when looking at a distant object. The *right sursumvergence* (in which the prisms are so adjusted as to cause the right visual line to be the higher of the two) and the *left sursumvergence* should both be ascertained. It is usually best to leave some interval of time between the two tests, as after making the effort required to produce right sursumvergence (or left deorsumvergence) it is difficult at once to perform the contrary action.

A difference of 1° or more between the right and left sursumvergence or, in any case, a sursumvergence exceeding 3° (prism), indicates the probable existence of a hyperphoria.

Way in which the Tests are applied in Practice. In practice I have found it best to apply the tests in the following order:

(1) *Inspection.* I note the apparent relations of the eyes in the primary position and also for associated parallel and convergent movements, using for the purpose some rather fine test-object such as a pen-point which the patient is made to follow with the eyes as it is carried in different directions. Any very obvious deflection, e. g., a marked concomitant strabismus or a paralytic squint, can be made out at once by this means alone.

(2) *Screen and Parallax Tests.* These are made simultaneously. First, a test-object 20 feet off is taken, and then one at the ordinary reading distance. If inspection has revealed any marked deviation or one which increases notably in any given direction of the gaze, the screen test also is applied in different portions of the field of fixation in order to corroborate these findings.

(3) *Equilibrium Test* both for distance and near with the phorometer or with prisms in the trial-frame.

(4) *Test for Divergence* by means of prisms placed base in before the eyes (Abduction-test of most authors).

(5) *Determination of the Convergence Near-point* both in the median line (test for bilateral convergence) and also, as has been previously explained in the course of this brochure, in lateral positions of the gaze (test of eccentric convergence).

(6) *Test for Convergence* by prisms placed base out before the eyes (Adduction-test of most authors).

(7) *Diplopia Test* with candle at 40" or more, and sometimes also with card and dot at 12". In order to make this test available for diagnosis we must have some ready method of recording which shall indicate, not only the character of the diplopia, but also its approximate amount, the point at which it begins to appear, and the way in which it increases or decreases in different directions of the gaze.*

These comprise all the tests really necessary, and all these can in most cases be readily performed within ten minutes. If further tests are thought requisite, the *Sursumvergence Test* (8)

*A sample of the scheme which I have adopted for my entries is as follows:

Eu 20°, Er 25°—DL; Eu 25°, Er 30°—DL 2°, DX 2°, which would mean that when the eyes were carried 25° to the right and 20° up from the primary position vertical diplopia appeared; the image of the left eye being lower (left diplopia), and that when the eyes were carried 30° to the right and 25° up the image of the left eye was 2° below and 2° to the right of that found by the right eye (i. e., there was a left and crossed diplopia of 2° each).

and the mapping out of the Field of Fixation (9), may be undertaken. If they are, they should be left to the last, as they generally cause considerable strain of the eyes, and hence, if performed early, are apt to derange the normal relations of the eyes, and thus interfere with any tests that may be made afterwards.

If the patient is ametropic or presbyopic, the various tests enumerated should be made both with and without the correcting glasses, in order to ascertain the effect of the latter upon the muscular condition; and other factors that might modify the latter, e. g., the existence of atropine mydriasis, should also be noted.

(To be continued.)

SUB-CONJUNCTIVAL CYSTS.

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ILLUSTRATED.

Small, pearl-like lymph cysts of the conjunctiva are by no means rare. There is probably no observer of any extended experience, but what can recall cases of this character. A simple prick of the spear-pointed needle is always sufficient to radically relieve them.

But the larger sub-conjunctival cysts are sufficiently rare to warrant putting on record every striking case of this character. Such a case has been under observation during the past year.

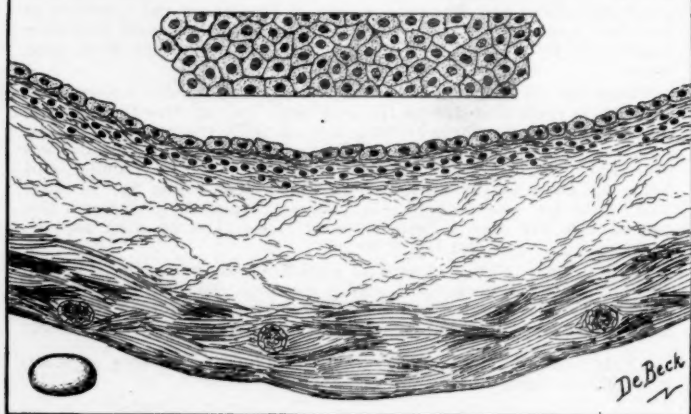
Etta M.—, aged 15, colored (negro), residing at Milldale, Ky., came to the Ophthalmic Clinic Medical College of Ohio, on Feb. 1st, 1896.*

She was an unusually large, well-developed, robust and perfectly healthy girl. No serious illness of any sort was noted. For two years past there had existed a feeling of uneasiness and irritation in the right eye; and for several months past the lower lid had been puffed out by a thickening behind it. There was annoying epiphora.

There was no congestion, nor, apparently, any special irritation of the eye, beyond that due to the epiphora; but on forcibly drawing down the lower lid, there rolled into view from the lower cul-de-sac, two large, rounded, pellucid cysts. One, near the inner canthus, was pear-shaped, 15 mm. long and 5 mm. in diameter, its rounded end being adherent to the caruncle and plica. The other, in the outer half of the lid, was oval, 10 mm. long and 6 mm. in diameter. The photograph will give a better idea of these growths than any description can. She had Hm. 1.00 D.

On February 15th, the smaller oval cyst (shown natural size in the plate) was dissected out, under cocaine. The conjunctiva was freely movable over it; and its removal was not difficult, only the greatest delicacy being required to avoid rupturing the extremely

* This patient was presented at the Cincinnati Academy of Medicine, March 23rd, 1896.



fragile cyst-wall. It was preserved in equal parts glycerine and 10% chloral. On March 28th, an attempt was made to dissect out the larger pear-shaped cyst. As this was adherent to the caruncle, and the anaesthetic effect of the cocaine here not so profound, an unguarded movement was made and the cyst instantly collapsed. There was evacuated a few drops of clear, pale straw-colored fluid. The cyst-wall became at once so indistinguishable from the adjacent structures, that no attempt was made to remove it. This would have been absolutely impracticable.

The patient was last seen September 11th. The site of the smaller oval cyst (that had been dissected out entire), was still perfectly free and smooth. At the site of the larger pear-shaped cyst (that had collapsed), was a small oval clump, not so large as a grain of wheat. Whether this was merely the collapsed remains of the cyst, or a beginning recurrence, could not be determined with absolute certainty. From its rounded smoothness, and a certain semi-pellucid reflex, I am rather inclined to believe that it is a recurrence. The epiphora has disappeared.

As regards the causation of these sub-conjunctival cysts, no satisfactory conclusion has been reached; and really, no satisfactory hypothesis has been even advanced. Almost all the cases observed, have been in children, or young persons; the above case falling also into this category. Probably a merely fortuitous interference or blockage of some of the natural lymph structures, at this time of rapid and active growth, is the starting point in this cyst development. A number have been observed in operation wounds and after traumata.

As regards the histological development of these little cysts, there is room for some difference of opinion. Possibly, they develop by the mere expansion of some natural small lymph space. Possibly they begin by the retention of fluid, in some space in the areolar tissue; grow by the enlargement and fusion of neighboring spaces, and eventually the enlarged cavity gains a distinct wall. Those not possessing an epithelial lining undoubtedly form in this way; or, possibly, both of these modes of growth occur in different cases.

The microscopic examination of the cyst wall, in an old case, will not give any certain clue as to its development, as a rule. The small cyst secured entire, was embedded in paraffine, and sections made. Even before embedding, it was noted that its capsule was perfectly smooth, distinct and independent of surrounding tissues, as its ready removal had indicated. Had this not been the case, its removal entire, in view of its extremely delicate wall, would have been practically, almost impossible. On opening the cyst, preparatory to embedding, it was noted that its wall, even as thin as it was, was composed of two layers which could be separated quite easily.

The sections show that the cyst is lined with a layer of pavement epithelium. The cells are large, irregular and comparatively thick for pavement epithelium. They are granular, with oval nuclei. Just beneath this is a thin layer of close connective tissue, among which are noticed numerous nuclei staining brightly. Then comes a loose open band of delicate connective tissue, which explains the ready separation of the wall into two thin sheets. Outside of all is a closely woven layer of ordinary connective tissue. In this are a few minute capillaries. The exact normal relations of some of these structures, especially the epithelium, have probably been disturbed in some measure during the embedding and cutting, but I have aimed to reproduce the appearance faithfully. At one point a small bit of the section that has fallen flat, shows a face view of the pavement epithelium. It presents the ordinary mosaic of irregular cells, with oval nuclei, the nuclei forming a relatively large portion of the cells. That this structure is the dilatation and modification of a pre-existing minute lymph vessel seems most probable. The cyst was simple or single, as is always the case.

The fluid examined under the microscope was barren. There was some debris of broken down cells. There were almost no leucocytes found, so that its character as a lymph space had been lost in its modification. Thus, these cysts seem to come rather under the heading of the "exudation" cysts, than under the true "retention" cysts.

The number of reported cases is not large, and those that closely resemble the above case are quite few.

Laqueur (*Klin. Monatsbl. fuer prakt. Augenheilkunde*, XV. p. 226, 1877), reports a closely analogous case. A sub-conjunctival cyst was observed in the lower cul-de-sac, left eye of a girl of 21. Extirpated, the wall was found to be composed of connective tissue fibrillae, lined with a layer of polygonal epithelial cells. The serous contents contained but a few cells and cell debris.

Bull (*Amer. Jour. Med. Sci.*, Jan., 1878) published an interesting paper about the same time; but none of his five cases are exactly similar to the above. Two were cysts at the outer canthus, and dipping somewhat into the orbit; thus approaching more the group of orbital cysts. One was a pre-lachrymal cyst, and the other two were serous cysts of the caruncle.

Makrocki (*Klin. Monatsbl. fuer prakt. Augenheilkunde*, p. 466, 1883), reports a case of such a cyst in the upper cul-de-sac,

nasal half in a boy of 12. It was 12mm. \times 14mm. Its contents were clear, neutral in reaction, and free from lymph cells. A bit of the front wall extirpated, showed it was lined with endothelium, i. e., flat epithelium. This position is unusual, and the size above that which is generally noted. He thought it was possibly due to trauma, although there was no distinct evidence or history of this.

Moyne (*Bollitino di Oculistica*, VI, p. 178, 1884), has had the fortune to see three such cases, in 26 years work. They were all in the lower cul-de-sac. They were transversely oval and movable beneath the conjunctiva. The walls were lined with granular epithelium; the contents serous with a few free epithelium cell remains. These cysts were of very slow growth and gave no trouble. In the absence of any other ascertainable cause, he is inclined to regard them as congenital. This view is, however, not generally accepted, and in certain of the cases is not tenable at all.

Removal entire, by careful dissection, is the best treatment for these cases. The mere evacuation of the contents, by puncture, is very liable to be followed by re-filling in a growth with such a well-developed wall as these cysts generally possess.

GLAUCOMA; ITS SYMPTOMS, VARIETIES, PATHOLOGY AND TREATMENT.

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ILLUSTRATED.

CHAPTER 1.

SYMPTOMS AND THEIR EXPLANATION.

(The figures in the text refer to the bibliographical list at the end of each chapter.)

Glaucoma, which forms about one per cent of all the diseases of the eye (Fuchs, 1), is a subject of great interest to the ophthalmologist, an interest which ought to be shared by all practitioners of medicine, because, unfortunately, its symptoms so closely simulate other diseases, that it is by no means an uncommon thing that their true origin is overlooked, with the unhappy result that valuable time is wasted, or improper remedies applied; so much so, indeed, that vision has frequently gone beyond recall before a correct diagnosis has been made. This is a condition of matters which every ophthalmic surgeon of any experience has had frequently to deplore, for a tentative diagnosis is usually easy without an ophthalmoscope, and all that is wanted is that the practitioner bear in mind, firstly, that there *is* such a disease as glaucoma, whose symptoms may much resemble rheumatism and neuralgia of the head and face, including the teeth and ear, sick headache, as well as some common forms of inflammation of the eyes, and that it is sometimes attended by fever and vomiting; secondly, that atropine *is not* a panacea for every ocular ill, but on the contrary is harmful in many, especially in glaucoma, and should never be used except

with full understanding of its action in the disease for which it is employed; and thirdly, that he make himself acquainted with the resistance, or "tension," of healthy eyes when palpated as for an abscess, and remember that in glaucoma this tension is greater than normal.

If attention be paid to these points glaucoma will seldom go undetected, for, in chronic cases, in which all active symptoms and high tension may be in abeyance, the visual symptoms draw the attention of the patient and the surgeon in the right direction.

In an acute case the painful symptoms frequently begin at night, and the first visual discomfort is frequently the appearance of halos, rainbows, or rings of colored light, surrounding flame of gas or lamp, while objects seem to be enveloped in a fog, and the field of vision is diminished.

The lids are now discovered to be red and swollen, the conjunctiva injected, even chemotic, the anterior ciliary veins enlarged and forming a dull red circle around the cornea, which itself is hazy, possibly superficially uneven, especially at the center, causing all behind it to be dimmed or altogether invisible, while it is more or less insensitive to touch. The pupil can, however, usually be seen to be enlarged, perhaps irregular, and then most often is oval with the long axis vertical, and presenting that greenish hue from which the disease received its name. The iris reacts slightly and slowly, or even not at all. It seems to have lost its brilliance and something of its color, while its finer markings may have disappeared.

The anterior chamber, between the iris and cornea is shallower than normal, and when the eye is palpated between the fore-fingers it is found to be too hard.

On the basis of these observations a diagnosis of glaucoma can safely be made, but the surgeon will naturally desire to see what the ophthalmoscopic picture is. If the condition of the cornea permit, he will find the other media clear, or the aqueous perhaps a little cloudy. On the disk, the veins will be enlarged and tortuous, probably pulsating, the arteries small, and possibly pulsating; and besides at this stage probably nothing remarkable will be observed. Such is the eye during an acute attack, but it would be a mistake to look upon this as the only type of the glaucomatous condition. On the contrary, such attacks are usually intermittent, besides which there is often an initial, or "prodromal" stage, lasting any length of time from days to years, during which the eye is subject at intervals, at

first, often of months, later maybe of days, to symptoms resembling the above attacks, but milder, and limited often to halos and slightly foggy vision, with perhaps a little pain and congestion. Each of these abortive attacks, which are especially apt to appear during fatigue, hunger, or anxiety, soon passes away, perhaps after the first sleep or meal, vision returning to its normal, except that difficulty of accommodation may become abnormally apparent, presbyopic glasses being frequently exchanged for stronger ones. When the prodromal stage has passed by gradual accentuation into the acute, and this has become "confirmed" by the continuation of the attacks, the eye is found to be deteriorating, never quite free from congestion with raised tension, and a vision which does not return to the normal between attacks, and after each one becomes less and less acute.

It is now that a condition of the disc, important from the points of view of both pathology and diagnosis, and which has not yet been touched upon, is in all likelihood to be discovered—the glaucomatous cup or excavation, a depression of the entire optic nerve head which has usually lost something of its color and become atrophic looking.

The third stage, called "glaucoma absolutum," is reached when, having continued to deteriorate till the field has first been reduced to merely indifferent central vision, and then that also having been destroyed, the eye has finally become quite blind, though probably without cessation of discomfort, for it may for long continue inflamed and hard, but holding out false hopes to the patient's mind, through the flashes of light, "photopsia," mere subjective symptoms, that vision may yet be recovered. The whiteness of the sclera now tends to take on a bluish tint, edged around the cornea by the red circle of the distended ciliary veins; the cornea remains insensitive, possibly more or less opaque, and even roughened externally by epithelial ulcers, which may also extend more deeply into its substance. The anterior chamber is shallow; the pupil still large, irregular, and greenish; and the small circle of greyish iris is bordered at the pupil by a ring of black pigment. The globe is very hard, and the disc is deeply excavated. At this stage Brailey (2), Pagenstecher, etc., have observed the excavation fill up again with new tissue.

The further changes through which the eye passes are those of degeneration. As the softening tissues give before the internal pressure, the globe tends to become square, bulging be-

tween the recti muscles, and staphyloma may also form at the equator, in the region of the ciliary body, with the anterior ciliary vessels visible in front of it, "Ciliary Staphyloma"; or between the ciliary body and the cornea, "Intercalary Staphyloma," when these vessels lie behind it. The cornea also becomes opaque, and perforation may result from ulceration, and lead to iridocyclitis, panophthalmitis, and phthisis bulbi. The lens usually becomes cataractous, and sometimes calcareous. Secretion ceasing with the destruction of the ciliary region, tension then goes down, until the globe becomes quite soft and shrinks, when first the patient obtains relief.

Instead of passing through the comparatively long stages as described above, the disease may take not more than a few hours or even less to carry an eye from normal vision to total blindness, "Glaucoma Fulminans," which affords a striking contrast to another form, "Glaucoma Simplex," in which the destruction of the eye drags slowly through a period, sometimes of many years, with little or no painful or inflammatory symptoms, and marked, maybe, alone by gradual deterioration in acuity of central vision, and in the dimensions of the field. But not uncommonly these chronic cases have seasons of accentuation when halos are seen and vision is more distinctly dimmed. Though the cornea is generally clear the ciliary veins are frequently enlarged; the anterior chamber may or may not be shallow; the iris may or may not be of normal color, size, and shape, and may react well or indifferently. In short, the anterior segment of the globe may appear normal, or may present more or less of the symptoms to be found in acute cases.

When the tension and anterior parts of the eye give only an indefinite clue or none, to the true nature of the disease, the diagnosis rests chiefly upon the condition of the disc and upon certain visual symptoms.

Between the two extremes, Glaucoma Fulminans and the quietest form of Glaucoma Simplex, the interval is completely filled by other types constituting a continuous chain, at no point in which can lines of absolute demarcation be drawn, to form definite divisions according to acuity. In the majority of cases, both eyes are affected, either simultaneously, or the second follows the first at an interval which may extend even to years.

SECONDARY GLAUCOMA.

Certain diseased conditions of the eye have a causal relationship to Glaucoma which will be discussed more fully later on. Among these are haemorrhagic retinitis, intra-ocular tumors,

iris bombé, anterior synechia, swollen or dislocated lens, congenital malformations, etc.

EXPLANATION OF SYMPTOMS.

It is held by the majority of authors that the other symptoms of glaucoma are secondary to the increased tension, or that increased tension and glaucoma are practically synonymous; but, as will be seen later, some surgeons believe that the optic nerve changes begin before the appearance of *plus* tension, and some that Glaucoma Simplex may run its course with normal tension, while others consider that in these cases the tension is *relatively* high because the lamina cribrosa is unnaturally weak. (See pp. .) How the tension is increased, in the first place, will be discussed under the heading of etiology; but, having once appeared, its effects soon follow, and, on its reduction to normal, they speedily disappear, those, at least, which are not due to changes which, through the continuance of the high tension, have become of a necessarily permanent character. The higher and the more sudden the abnormal tension the more intense are the symptoms. Its effects have been compared (Critchett, Priestley Smith, 3, Fuchs, 4) to those of an incarcerated hernia.

THE SWELLING OF THE LIDS AND CONJUNCTIVA,

Present in very acute cases is probably the result of blood stasis in vessels in the neighborhood of the globe, due to the reaction of the vaso motor nerves to the irritation of the sensory nerves of the eye, and resembling that produced by a foreign body in the orbit.

THE ENLARGEMENT OF THE ANTERIOR CILIARY VEINS

Is due to the pressure on the vortex veins, which pass obliquely through the sclerotic closing them to some of the fluid which should leave the eye by their channels, but is forced instead to take the route by the anterior ciliary veins.

THE HAZY CONDITION OF THE CORNEA

Was first described by Liebrich in 1863, and was supposed by many (e. g., by Mauthner, 5) to be due to keratitis; but this supposition may be set aside on account of the rapidity of its disappearance on reduction of the intra-ocular tension. Both Arlt & Leber had already ascribed it to oedema, when Fuchs (6) described the spaces between the corneal lamellae, and chiefly anteriorly as infiltrated by a coagulated fluid, which penetrated also to Bowman's membrane, and surrounded the nerve filaments which reach to the superficial epithelium. If

this corneal oedema were due, as suggested by Knies and Weiss, after experiments with chemical agents, to the passage of the aqueous humor, under the influence of pressure, into the corneal tissue, we should not, as Treacher Collins (7) suggests, expect to find the posterior layers less affected than the anterior, as is actually the case. It is more probably due to interference with the circulation of the nutrient fluid of the cornea which tends to collect towards its center.

THE HALOS OR RAINBOWS

Seen in the early stages, during short intermittent attacks, have certain constant characteristics. The outer ring is always red and the inner is bluish; the former more visible around gas and candle light, the latter around the electric light. Between the inner ring and the light is usually a clear space, but occasionally having lines radiating through it. The farther away the light the larger the halo, which, by the perimeter, measures from seven degrees (Donders) to ten or eleven degrees (Laqueur). Rarely a second halo has been seen outside the first. Mauthner (8), though he saw the possibility of the corneal oedema causing the rainbows, was inclined to think them due to nerve irritation, as was also Dobrowolsky (9) after experimentally producing congestion of his own head and eyes. Donders (10) was the first to produce some proof, in 1850, that they are dependent upon an actual lesion of one or other of the ocular tissues. This he did by showing that on covering the lower half of the pupil, the halo disappears in the superior external and inferior internal quadrants, and the reverse when the upper half is covered; also, that the halo remains in the same position when the eye looks some distance from the light. The dilatation of the pupil and alterations of the lens when accommodating, he thought had some influence in the production of this symptom.

De Wecker attributed it to slight changes in the corneal epithelium, due to temporary increase of pressure; and Treacher Collins (11), in a review of the subject, relates experiments by which, with a 0.125 per cent. solution of hydrochlorate of erythrophloeine he had produced, while the tension remained normal, a condition of the cornea exactly resembling in appearance that found in early glaucomatous tension, and associated with very slight corneal insensibility with blurred vision, and precisely similar halos. By its means he has shown that these halos have no connection with the size of the pupil, with the refraction of the eye, or with the condition, or even the presence,

of the lens. Still, that the lens may give rise to halos is asserted by Homolle and Quevenne, and Lauder Brunton (12) produced them by the use of digitalin, a result he believed, of a slight opacity of the lens. Cocaine also produces an opacity of the cornea, which is, however, unassociated with halos, because, according to Treacher Collins, it is too intense, and corresponds with the later stage of glaucomatous oedema when the halos have passed away. But the writer has frequently observed "glaucomatous halos" follow immediately upon the use of a 1 per cent. solution of cocaine in combination with alum and sulphate of zinc, though he has been unable to produce these when the ingredients were used separately. While these exist in glaucoma the lesion is confined to the epithelium which, if rubbed off leave a perfectly clear cornea. Wurdinger (13), after experiments on rabbits with cocaine and fluoresceine, says that the former causes shrinking of the whole cornea; that in the late stages, epithelial cells are cast off in portions of it; and Thomalla (14) further proves the resemblance between the glaucomatous and cocaine opacities, by showing that, in acute glaucoma, fluoresceine always, in his experiments, colored some portion of the cornea.

Priestley Smith, before Collins made his experiments, thought that the halos were due to "the latent physiological aberration being in some way rendered manifest or exaggerated," but now (15) he is satisfied that they should be ascribed to the peculiar condition of the corneal epithelium described above. In mild iritis (Schweigger 16) from the pressure of a film of secretion upon the cornea in conjunctivitis, and in normal eyes sometimes when the pupil is dilated (Berry 17), halos have been found. The insensibility of the cornea was ascribed by Fuchs (18) in 1882, to oedema of nerve endings, and in 1893 (19) he says of it, "through the high intra-ocular pressure the ciliary nerves are compressed and paralyzed; in this way the insensibility of the cornea comes about."

THE IRIS.

The change in the hue of the iris, and any obliteration of its delicate markings which may be found in early glaucoma, have been considered by many (as by Mauthner (20) in 1878, and Brailey 21, in 1881), to be due to actual inflammation; but that opinion is not now so commonly held, but rather that these are due to simple hyperaemia, the result of venous stasis, and producing rigidity and oedema of the iris, and occasionally even haemorrhages (Schnabel (22), Treacher Collins (23), Fuchs (24). At the same stage the comparative immobility

of the iris, and the large size and irregularity of the pupil, are usually considered to be due to paresis of nervous fibres within the eye. Schweigger (25) remarks, "that the ciliary nerves are very sensitive to pressure is proved by the occurrence of mydriasis traumatica which may follow contusions of the eye which leave behind them no bad effect." By others the condition is ascribed to constriction of the vessels entering the iris. Objections might be urged to each of these theories, and probably the results are not always due to the same cause. Thus: there is no real paralysis, because the iris reacts to both eserine and atropine. Then why should the pupil dilate when the ciliary nerves are pressed upon? The sympathetic fibres must receive a compression equal to that upon those of the third nerve; or, does this merely go to show that when nerve influence is altogether removed from, (for paralysis rather than stimulation is indicated by the long continuance of the pupillary dilatation) or equally restricted in, the various nervous fibres of the iris, the position of rest is that of dilatation such as occurs in advanced poisoning by chloroform?

On the other hand, we know that hyperaemia of the iris, as in the early stages of iritis, produces contraction of the pupil, while anaemia of it, as caused by cocaine, produces dilatation. In glaucoma we have a combination of hyperaemia and dilatation.

The oval shape of the pupil is capable of explanation on the ground that the iris in glaucoma is frequently, by the ciliary processes, pressed against, or is even adherent to, the back of the cornea, and not usually equally so at all points of its circumference. At the later stages the iritic changes are of a different type, for then the vessels have been in a great part obliterated by long-continued pressure, with secondary atrophy of the true tissue, and to some extent replacement of it by new connective tissue fibres. The black border at the pupillary margin "Uveal Ectropion" is due, according to Knies (27), to the organization of inflammatory material on the front of the iris, pulling the uveal pigment round to the anterior surface; but Treacher Collins (28) ascribes it to shrinking of the stroma of the iris more markedly than of the pigment on its posterior surface.

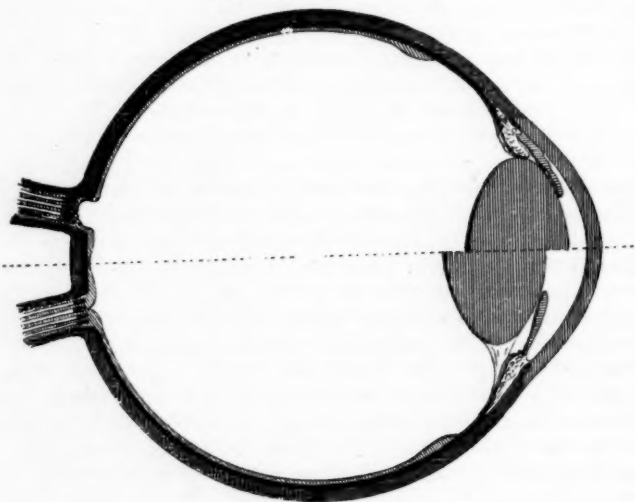
THE COLOR OF THE PUPIL

Which gave origin to the name of Glaucoma (Greek—sea-green) as well as to its old title of "green cataract," is produced by the reflection of the light entering the lens, modified by the state of the cornea and aqueous humor. It is not peculiar to

glaucoma, and is seen in other conditions where dilated pupil and imperfectly transparent media are associated.

The shallowness of the anterior chamber is in primary cases, no doubt, usually due to the excessive pressure behind the lens, zonule, and iris, which brings the iris into closer apposition with the cornea, but as Priestley Smith (29) remarks, it is not necessarily so, for the lens may be of excessive thickness from a natural growth or from cataractous swelling. In some secondary cases, it is caused by a dragging forward of iris, ciliary processes, lens, or vitreous, by adhesions between these and the cornea. There are certain cases to be discussed later in which the anterior chamber is not shallow.

Glaucomatous



Normal.

THE MEDIA.

At the beginning of a glaucomatous attack, unless when associated with uveal inflammation, the aqueous, lens, and vitreous are all clear, but soon on account of exudation from enlarged vessels, the aqueous and vitreous may lose their perfect transparency. In the late stages the lens, like other parts of the eye, degenerates, and this form is to be distinguished

from an ordinary simple or traumatic cataract appearing in a glaucomatous eye. This may be done, according to Fuchs, because the former shows a more noticeable swelling, a bluish white color, along with a bright silky sheen.

THE ENLARGEMENT AND TORTUOSITY OF THE RETINAL VEINS

Is explained by the difficulty experienced by the blood in returning through vessels which are specially exposed to pressure where they bend into the optic nerve and pass through the lamina cribrosa.

THE PULSATION OF THE RETINAL VEINS

Was described by Van Tricht of Utrecht in 1853, and in the same year by Coccius; and Donders concluded, from his investigation of the subject, that this pulsation is normal in all eyes and at all ages. As a matter of fact by careful observation of the vein upon the disc, at which point its internal pressure is lowest, and especially after it has bent into a physiological cup, the pulsation can be very frequently seen, and Lang and Barrett (30) found it in 73.8 per cent. of the eyes examined by them at Moorfields. It may be present at one time and not at another in the same eye, and is usually easily called up by a slight external pressure. It has been explained by five or six theories, differing somewhat in detail, but all referring it to the momentary increase of blood tension produced by the contracting heart, which causes either pressure from without on the walls of the retinal veins, rhythmically contracting them, or, by a local backward pressure on the venous blood column, rhythmically dilating them.

THE DIMINUTION IN SIZE OF THE RETINAL ARTERIES

Is due to the fact that the increased intra-ocular tension prevents the normal amount of blood from entering the eye. v Graefe (31) in 1854, described as a "constant thing in glaucomatous amaurosis," "the presence of pulsation of the central artery of the retina, spontaneous, or produced by light pressure of the finger." To Donders has been ascribed the credit of pointing out that "this arterial pulse can be induced in healthy eyes, also by a gradually increasing pressure on the globe, and that, at the moment when the pulse appears, vision is temporarily abolished" (Snellen, 32); but v. Graefe writes in 1854

(33), "in physiological circumstances one must use a very considerable pressure for the production of the arterial pulse," and Donders (34) himself says, in 1855, "it belongs to v. Graefe to have shown with certainty the appearance of the arterial pulse produced by strong pressure," while v. Graefe, (35), on the other hand, wrote, in 1857, "through artificial pressure on the globe, we make the arterial pulse to appear (Donders)."

Although a case has been reported by Gowers (36), in which nothing pathological could be discovered to account for it, and which he considers to be always the result of disease, though not necessarily of the eye itself. It is, however, strong presumptive evidence of glaucoma, which is by far its commonest cause. It is due to the altered relationship between the tension inside the intra-ocular vessels, and that outside them. Normally, owing to the small size of the vessels, and to the pressure on their walls, exerted by the ocular tension, the stream of blood in these arteries proceeds in an equable flow without visible pulsation but when the intra-ocular tension is raised to a certain point, it causes collapse of the arterial walls except during the heart's systole, when the blood pressure, of course, is increased, resulting in a rythmical dilatation of the vessel. In a similar way it arises when the intra-ocular tension is high only relatively to that inside the vessel, i. e., when the vascular tension is diminished, as for instance, in the case recorded by Wordsworth (37) where it suddenly appeared in a patient on the point of fainting; in acute anaemia from haemorrhage, and in chlorosis, in which it is due, according to Raehlmann, to hydraemia, and, according to Schmall (38) to "a certain amount of cardiac contraction combined with sudden relaxation of the heart muscles, occurring in certain states of low arterial tension;" in Graves' disease; and in local compression of the central artery within the nerve in optic-neuritis (Fuchs, 39). Retinal pulsation has also been observed when the arterial is relatively greater than the intra-ocular tension, as when the latter is reduced in typhoid fever (Schmall, 40); or, from an increase in the vascular tension, in aortic regurgitation (Quincke, 41, Becker, 42, Fitzgerald, 43, S. MacKenzie, 44), in which it is not uncommon; and the greater the hypertrophy of the left ventricle, the more marked it is. It differs from the pulsation of *plus* tension, in that it is often visible, not only on the disc, but well towards the periphery of the retina." "It consists, like the pulsation of other vessels, in a widening and elongation" (Gowers). Berry (46), whilst admitting that the above explanation of glaucomatous

arterial pulsation holds good sometimes, asserts, on what grounds he does not state, that, "in many cases, at least, it is due to an active spasmodic contraction of the vessels themselves."

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CHAPTER 2.

EXPLANATION OF SYMPTOMS (CONTINUED).

PAPILLITIS.

Most authorities do not include papillitis among the symptoms of early glaucoma, though a condition of hyperaemia and oedema are not uncommonly described, and it is sometimes difficult to know whether or not the authors who mention it consider this a true inflammation which should be classed with the neuritis, which is by some declared to be a usual accompaniment of glaucoma. Thus Jaeger (in 1876) thought the cup was preceded by a true inflammation of the head of the optic nerve, in which he was supported by Klein. Brailey (1) said that when high tension was not of long duration he found microscopically the optic nerve swollen, and the lamina cribrosa yielding backwards; and Mauthner (2) believed the optic nerve to be softened by a morbid process secondary to choroiditis, so as to cup later under normal tension. Brailey and Edmunds (3) concluded from their observations that in primary Glaucoma, "Neuritis" precedes the increased tension. Brailey (4) again stated his belief that a pre-glaucomatous stage exists with, among other things, in every case slight haze and swelling of the papilla, and, in the same year he wrote (5) "before plus tension, are always present inflammations of the ciliary body and optic nerve." Gruening (6) recognized a congested disc as one of the early features of certain cases, and present along with the first premonitory symptoms. Knies (7) has written, "among the earliest and most characteristic appearances I found marked hyperaemia and oedema of the entrance of the optic nerve. This appears to be the regular beginning which passes in weeks, into cupping. It fails in no eye which is examined before the cupping;" and Fuchs (8), "the reddening and veiled appearance of the head of the optic nerve during the inflammatory attack are produced by hyperaemia with some oedema." Bitzos (9) asserted that "the symptom first

(To be continued.)

AN OPHTHALMIC LIGHT-SCREEN OR COVER-
CHIMNEY.

BY JAMES THORINGTON, M. D.

ADJUNCT PROFESSOR DISEASES OF THE EYE, PHILADELPHIA POLY-
CLINIC, ETC.

ILLUSTRATED.

The favor which my former asbestos chimney¹ has received, and friendly suggestions for further changes or additions, prompt the writer to present the one shown in the accompanying cut.



In place of one disk, as in the former, there are two, superimposed and revolving independently of each other. The lower disk contains a round piece of white porcelain glass 30 mm. in diameter, also four round openings respectively 5, 10, 20 and 35 mm. in diameter. The upper disk contains a round 35 mm.

(1) *Annals of Ophthalmology and Otology*, January, '95, p. 5, and *The Philadelphia Polyclinic*, Vol. IV, November 16, 1895. No. 46.

opening, a round section of blue cobalt glass, a perforated disk, a vertical and a horizontal slit, each two and one-half by twenty-five mm.

The several uses of this screen are as follows:

1. For the ophthalmoscope, a good light is obtained by superimposing the two 35 mm. openings.
2. Combining the 35 mm. opening in the upper with either the 5* or 10 mm. in the lower disk a source of light is procured for the small plane skiascope; and
3. By substituting the 20 mm. opening, light is had for the concave skiascope.
4. Placing the cobalt glass over the 5, 10, 20 or 35 mm. opening, and the chromo-aberration test² of ametropia is given.
5. To test for astigmatism at one meter while using the plane skiascope, or for heterophoria at 6 meters, the perforated disk is to be turned over the porcelain glass (the latter producing a clear white image).
6. The horizontal slit³ placed over the porcelain glass and the operator may exercise the oblique muscles.
7. The vertical slit similarly placed gives the test for paralyzed muscles.⁴

NOTE. In any test for hereophoria or ametropia a dark background of black cloth is suggested.

To Messrs. Wall & Ochs, makers of this screen, I am indebted for this skilled workmanship and the illustration.

* Skiascopy by Jackson, page 38.

(2) Norris and Oliver, page 254.

(3) Suggested in personal letter from Dr. G. C. Savage.

(4) Noyes, pages 139, 140, 141, 142.

NOTE UPON A METHOD FOR PICTORIAL ILLUS-
TRATION OF THE NORMAL AND PATH-
OLOGIC EYE.

BY H. V. WÜRDEMAN, M. D.,

MILWAUKEE.

DIRECTOR AND SECRETARY WISCONSIN GENERAL HOSPITAL; OCULIST AND
AURIST TO THE CHILDREN'S HOSPITAL AND TO THE MILWAUKEE
COUNTY HOSPITAL FOR THE CHRONIC INSANE.

We have recently secured exceptionally good specimens of various pathologic states of the eyeball, prepared after the method of Priestly Smith¹ as modified by Wilder,² being half sections of the eyeball hardened in formalin, frozen and divided, and then mounted in clear gelatin in glass jars prepared for that purpose.

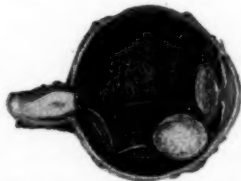


Fig. 1.—Longitudinal Section of an Eyeball with Sarcoma of the Choroid which was Enucleated before Blindness. Increase of Tension. Pain or Inflammatory Symptoms had occurred. Patient could yet see to read, but had vertical hemianopia. The Section well shows the normal relations of the intraocular structures, especially the ciliary processes, the venae vorticosae and the choroidal cleft.

Wishing to exactly reproduce these for an article (to be published in a forthcoming number of the *Annals of Ophthalmology and Otology*, with a number of illustrations), I endeavored to have photographs made, but found that no ordinary exposure could sufficiently elaborate the detail. When it is borne in mind that the bottom of an half eye is nearly half

an inch from its cut edge or periphery, it will be seen that these lie in different planes, and no ordinary lens or exposure will give a sufficient depth of focus for proper expression of the detail in the negative or print. Such may only be obtained by exceedingly long exposures, the use of the smallest diaphragms, and a rectilinear lens. (See Fig. 1.)

Accordingly after many trials, the specimens in the jars were exposed in bright sunlight from six to eight hours, a copying camera being used with the smallest diaphragm, a deep orange cell made expressly for the purpose being placed before the objective in order to filter out the heat and the non-actinic rays. An orthochromatic plate was used in the holder, and the specimens enlarged one-third. The backgrounds were stopped out in the negative, and the photograph (a platinum print) reproduced (reduced one-third) by the photo-tint process (Binner Engr. Co., Chicago), with the excellent result seen in the accompanying figure. Such faithful adherence to the natural appearance of the specimen could not be secured by the brush of the artist.

805 Grand Avenue.

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¹Priestley Smith, *Ophthalmic Review*, 1884.

²W. H. Wilder, *Trans. Sect. Ophth. A. M. A.*, 1895.

A FEW NOTES FROM SOME OF THE PARIS EYE CLINICS.

BY DR. JOHN BERGESON.

A year's residence in the French capital does not perhaps constitute one an infallible judge of the merits and demerits of French ophthalmology but a few observations made by me during 1895-96 will probably interest the readers of the *Annals*.

The Paris Eye Clinics are so arranged that a student can work from eight o'clock in the morning until seven o'clock in the evening.

The clinic of Prof. Panas is held at the Hotel Dieu, as he is a member of the faculty of the University. Those of all the other men are private, at which, while clinical instruction is given, no fee is charged. Professor Panas begins his teaching at 8 a. m., first seeing all the new patients and such old patients as are of interest to the students. He is very systematic and deliberate in the examination of his patients especially of those in which the trouble may have some obscure origin. He talks continuously while examining the patient but in a voice so low that it is scarcely audible (a peculiarity which has also been adopted by his chief of his clinic). At 10 a. m. he lectures for about half an hour and then operates. His operations are all neatly and quickly done, he being especially known for his plastic operations.

Landolt's clinic (Rue St. Andre' des Arts) begins at 12 o'clock. He is particularly cordial to Americans and always makes an effort to please them. In addition to French he speaks English, German, and Italian. There is perhaps no man in Paris who gives as much attention to refraction work and anomalies of the muscular apparatus, thus exemplifying, even in hospital work, his well-known penchant for these important sections of ophthalmic practice. He almost always

does an iridectomy in cataract extraction and in a great many cases does it as preliminary procedure, believing that in the majority of instances it insures a better result.

Galezowski's clinic in the Rue Dauphine is one of the largest in Paris. It is open each day from one until four o'clock. Of all the ophthalmologists in Paris Dr. Galezowski is the most cordial to those who visit his clinic. He does not neglect to shake hands when one comes in and when one goes out and always asks the visitor to come again. He is very quick and decisive in making his diagnosis and a cool quick operator. He gives one of the best courses on diseases of the fundus that can be had in Europe. Galezowski insists on syringing the lachrymal duct in all cases of chronic conjunctivitis, to see if any obstruction is present as he holds that a great many of the obstinate forms of conjunctivitis and blepharitis are due to lachrymal obstruction. After cataract extraction he uses a dressing made of soft rubber and mica which hermetically seals the eye. The soft rubber has a sort of window cut in it and into this is set a piece of mica. At the same time the other eye is covered with a shade. The patient is put to bed, and iced applications are applied to the eye just operated upon. The dressings are usually left on for three or four days, the iced applications being stopped when the dressing is removed. The patients are allowed out of bed after 24 hours but must keep quiet. In all cataract extractions he first washes out the lachrymal sac with a boric acid solution then cleanses the parts surrounding the eye with the same kind of solution and always does the simple extraction when possible.

De Wecker has a very large clinic in the Rue du Cherche Midi. He receives his new patients and gives clinical talks from 4 until 5 o'clock, lectures from 5 until 5:30 and then operates. His operations are always done by the aid of electric light, his operating room being the finest in Paris. Although De Wecker likes his joke and manages to keep his student audience in good humor at all times one never forgets or has occasion to forget that there is perhaps no man on the continent to-day whose opinion is as universally respected as that of De Wecker. He is about the only ophthalmologist in Paris who makes a practice of subconjunctival injections of sublimate (1-2000) using it in nearly all forms of corneal ulcers and interstitial keratitis. His results, generally speaking, are most satisfactory. One case which I particularly remember was a severe form of corneal ulcer in a middle-aged woman and after

one injection the grave symptoms subsided. These injections are repeated every day unless a too violent reaction takes place. In some the pain was very great but in the majority of instances it only lasted a few minutes. De Wecker thinks it the only rational treatment in such cases. He uses an ordinary hypodermic syringe. After cataract extraction he employs a simple dressing which consists of sterilized cotton and gauze and held in place by gauze strips placed diagonally across the dressing and these fastened to the skin with collodion. This dressing is left on about four days, the patient being allowed to get out of bed at the end of twenty-four hours. Before operation, he covers the patient's face with sterilized gauze having a hole cut in it for the eye that is to be operated on.

Valude and Trousseau may be seen at the *Quinze Vingt*. Trousseau is the "lightning" operator, using only the Graefe knife in cataract extraction, rupturing the capsule with its point and pushing out the lens with his finger pressing on the lower part of the cornea. Both Valude and Trousseau use a starched bandage over the ordinary dressing. Dr. Kalt is also at the *Quinze Vingt*. His hobby is stitching together the edges of the corneal wound after cataract extraction. He places his stitch between the layers of the cornea and conjunctiva before making his incision. A great many seem to have the idea that in placing the suture in position the anterior chamber is entered by the needle. That is not the case, as the stitch only goes through the corneal layers.

There was considerable discussion in the Ophthalmological Congress of the paper read by Dr. Lucien Howe of Buffalo, on the treatment of ophthalmia neonatorum. Galezowski took the opportunity to insist that any prophylactic treatment is pernicious and meddlesome, that ophthalmia neonatorum is always curable and that there is no excuse for losing any eye. His treatment consists of the application of 2½% of nitrate of silver but he insists on brushing the lids with it twice daily, himself.

Most of the Paris operators use a solution of eserine immediately after simple extraction while Panas exhibits it in the form of ointment.

ABSTRACTS FROM RECENT SPANISH OPHTHALMIC LITERATURE.

BY DR. A. B. HALE,

CHICAGO.

Wound of the neck, followed by ocular disturbances, is reported by Dr. J. Santos Fernandez, in No. 12, June, 1896, de *Cronica Medico-Quirurgica de la Habana*.

Patient was struck by a revolver bullet in the neck (near the carotid) on the right side. Paralysis of the right arm and paresthesia followed, with blepharoptosis of the right eyelid (Muel-ler's muscle). Six days afterward the ptosis was more marked, and the right side of the head sweated more than the left. The paralysis of arm disappeared in six weeks, but the eye and head symptoms remained, the right pupil appearing normal for distance, but showing myosis for accommodation. Visual acuity and visual field normal. This condition was reported permanent, although the patient escaped observation.

Enucleation of an eye, under cocaine anesthesia, after the appearance of symptoms of sympathetic ophthalmia in the other eye, with complete success, is reported by Dr. Lorenzo Chavez, in *Gazeta Medica de Mexico*, July 1, 1896. The patient, after an injury to the left eye, had fully recovered from the first irritation, but consulted a physician to assure himself. This first consultant attempted to remove the foreign body, but failed, and probably disturbed it so much as to set up inflammation. Enucleation was performed as soon as the other eye showed irritation, and the patient was at once relieved of all trouble.

A new method of operation in Keratoconus is reported by Dr. Castresana (*El Siglo Medico*, Madrid, 14 June, 1896, No. 2216) as having been performed by Dr. Santa Cruz, at the Ophthalmic Institute. The cornea, after being prepared for operation, with the lids widely opened, was pierced by a threaded nee-

dle in the vertical meridian; the thread was left in place, while a Graefe knife pierced the cornea in the horizontal median, making only puncture and counter puncture. A wedge-shaped piece was then cut from the cornea above the thread, the ends of which were then immediately drawn together to close the pit thus formed. The suture was left for four to five days; at the end of this time the corneal wound was healed. The object of the operation is to level the corneal apex. One case so operated on increased in visual acuity to 0.1 from only fingers at 0.2 centimeters, and no loss had been sustained for a year.

ABSTRACTS FROM CURRENT AMERICAN AND ENGLISH OPHTHALMOLOGICAL LITERATURE.

BY CHARLES H. MAY, M. D.,
NEW YORK.

**EXTRACTION OF THE TRANSPARENT LENS AS A PROPHYLACTIC MEASURE
IN PROGRESSIVE MYOPIA OF HIGH DEGREE AND IN
DETACHMENT OF THE RETINA.**

BY DR. L. VACHER, OF ORLEANS, FRANCE.

Annals D'Oculistique, Eng. Ed., July, 1896.

After reviewing the history of this operation, the writer says: "Since my communication to the Congress in 1894, I have performed fourteen more operations on the transparent lens, all of which have been complete successes, and all, I hope, of veritable service to the patients." He then gives a brief resume of these fourteen cases (he had previously published the histories of twenty-three cases). Concerning the effect of this operation upon detachment of the retina, he says: "I also stated in my first note, that extraction of the lens in complicated myopia of high degree had a preventative action on detachment of the retina. I deduced this statement from the contraction in the eye-ball, the diminution in the length of the optical axis, verified by diminution in the refraction. A very curious case has quite lately served as a proof, or at least a strong presumption in favor of what I have said: Last September the patient described as Case X, came to see me, and stated that she did not know what was the matter with the eye not operated upon, but that she could scarcely see with it, and only on one side. She was, on the other hand, greatly satisfied with the condition of the other eye, which enabled her to gain a livelihood. With the ophthalmoscope I found a large detachment in the right eye. This operation is, then, far from meriting the reproach of causing detachment of the retina. . . . I may also add that I have observed several cases of detachment in patients

with myopia of high degree, who had refused operation. Am I not right in thinking that extraction of the lens in the eye most seriously affected and consequently the most exposed, may prevent detachment and preserve the organ from loss?"

His conclusions are: "1. Extraction of the transparent lens is a grave operation, which should only be performed with great prudence and with the most rigorous antiseptic precautions. 2. Myopia, progressing rapidly between the ages of 12 and 16, may be operated upon after the age of 12 if there is a large staphyloma, and if the number of dioptries of myopia exceeds the number of years of the patient. 3. Only one eye should be operated upon, and that the most seriously affected. A second operation should not be undertaken until later, and that on the express request of the patient if the myopia continue to progress. 4. After 30 years, myopes of more than 15 dioptries being particularly exposed to detachment of the retina, one should not hesitate to extract the transparent lens when the visual acuity permits of it. 5. Extraction of the transparent lens to correct myopia of high degree should be called Desmonceaux's operation."

THE TREATMENT OF CERTAIN FORMS OF CATARACT.

BY DAVID LITTLE, M. D., F. R. C. S. E., MANCHESTER.

The Lancet, August 1, 1896.

In the course of an address delivered at the opening of the section of ophthalmology of the British Medical Association for 1896, Dr. Little spoke as follows: "When incipient cataract has advanced to a stage when vision is so impaired as to render the patient useless for any occupation, it is clearly our duty to relieve him if we have reasonable means of doing so. To be kept waiting in a semi-blind condition for a long and indefinite period—perhaps years—is a great hardship to those people in many ways, and is very depressing and often injurious to the health. There is abundant evidence that such cases can be safely dealt with by operation. The question appears to be, what is the best operation to perform, whether to extract the immature cataract at once, or mature it before extraction, by iridectomy and trituration of the lens, as recommended by Forster. The objection, I think, to the former method is the liability to retention of cortex and its consequences. In old people, cortex left in the pupil is slow of absorption, and during that tedious process, iritis is apt to occur, sometimes severely. With a view to avoid irritation from retained cortex, Mr. Tweedy ruptures the capsule at the periphery, after making the iridec-

tomy, so that, if the cortex should be left behind, it is retained within the capsule, and is likely to remain harmless. The main objection which some surgeons have to trituration of the lens is the fear the operation may damage the eye by undue irritation and iritis and synechiae, a condition of things which might militate against the success of the after-extraction.

I have had a fairly good experience in both operations, sufficient, I think, to enable me to form an impartial judgment on their respective merits. Up to five years ago, I was in the habit of extracting unripe cataracts in necessitous cases, every now and again by the combined method in the ordinary way, with this exception: to avoid as much as possible leaving cortex in the pupil, I made the section unusually long, so as to admit an easy escape of the lens with the least possible amount of pressure. In some cases, the result was all that could be desired; in others, again, the cortex found afterwards in the pupil often gave trouble and anxiety by iritis. Without troubling you with any statistics, I may say that the results on the whole were not equal to those of extraction of a naturally matured lens.

For the last five years I have adopted Forster's method in about forty cases in hospital and private practice. To give it a fair trial I made a selection of what I thought were really suitable cases, following Forster's recommendation as closely as possible. They were cases of uncomplicated senile cataract, with soft cortex in which cortical opacity more or less existed. Forster considers it essential that cortical opacity must have begun. The vision of these eyes varied from 10 to 20 Jaeger, and the progress of the opacity was known to have been exceedingly slow, extending in some cases over some years. After making a small iridectomy well back in the sclera, I massaged or rubbed the center of the cornea with a vulcanite or tortoise-shell spoon for about two minutes, exercising care and judgment in the amount of pressure. Beyond a little hemorrhage occasionally in the anterior chamber, nothing unusual happened in the operation. In no case did undue irritation follow; nothing approaching iritis; the opacity was complete in most cases within a fortnight, in a few it was nearly a month; no atropin was used before operation, and seldom afterwards; the after-extractions were all normal, there was no escape of vitreous, the healing process went on favorably, there was no loss of the eye, and the ultimate results were on a par with the extraction of a naturally mature lens. I have been much im-

pressed with the safety and efficiency of the operation. If it be done with reasonable care and judgment, I feel sure it is as safe as any operation can be, and I shall continue to practice and recommend it with perfect confidence. There are cases, however, in which I doubt if it would answer. Cataracts of deep amber color, uniformly hard throughout and no soft cortex, with a good deal of transparency, sufficient sometimes to enable one to see the details of the fundus—these cases, in my experience, can be safely extracted at once and with excellent results, and I have therefore never tried Forster's method in that class of case. I think trituration might possibly cause undue irritation, or what is more likely, it might fail to complete the opacity.

In zonular cataract and in some cases of traumatic or soft cataract, in young subjects, it is a favorite practice of mine to extract the lens with a Teale's suction curette in preference to linear extraction. I can rely upon it to clear a pupil more effectually than by linear extraction, and I have often been surprised it is not more generally used. It is said that there is danger of introducing septic matter through the tube and of sucking iris and vitreous, but if the curette is made clean and aseptic, and kept within the area of the dilated pupil, and not passed too deeply, accidents of that kind need not be feared. If I have reason to suspect a rupture of the hyaloid, I do not use it. In zonular cataract I have rarely found excision of a small portion of the pupillary portion of the iris improve vision, at least to any appreciable extent, and for many years I have given it up. I either leave the case alone or resort to discission and suction."

A SIMPLE OPERATION FOR ECTROPION.

BY KENNETH SCOTT, M. B., F. R. C. S., OF CAIRO, EGYPT.

British Medical Journal, September 12, 1896.

"In operating on cases of ectropion, I have found that no absolute reliance can be placed on the exact ultimate effect which will be produced by either of the varieties of operation usually employed—namely, the plastic skin ones, and those depending on the action of artificial cicatricial bands. Owing to there nearly always being some giving and stretching of tissues after the operation, more or less considerable in degree, the good effect which should be obtained by these operations is thus often very greatly neutralized. On the other hand, if, in order to allow for the ultimate partial failure so often caused in this way, an over-effect is intentionally produced at the time

of operation, some temporary deformity is naturally caused, which, unfortunately, in not a few cases, remains permanently. For this reason I have now, for several years, employed a form of operation whose effect is dependent on the firmer tissues of the eyelids—tarsal cartilage and orbicularis palpebrarum muscle. I use it for all cases of ectropion, excepting those extreme ones caused by cicatricial contraction, and also those accompanying, or the sequel of, neglected ophthalmia neonatorum.

The operation is easily performed without the aid of any special instruments, and simply with the use of cocaine. The external canthus and tissues beyond are thoroughly divided by a pair of strong scissors; the lower eyelid, which is usually the affected one, is then seized and its margin stretched sufficiently outwards, parallel to the border of the other lid, so as to restore the palpebral aperture to its proper appearance; the portion of eyelid margin thus made to extend beyond the site of the external canthus is removed, along with its contained eyelashes, by slicing it with a sharp knife. The upper and lower eyelids are then brought together, so that the original outer extremity of the one approximates exactly to the new extremity of the other eyelid. They are secured in this position by passing a silver wire suture vertically downwards through the substance of the upper lid, continuing it out through that of the lower one, and then twisting the ends firmly together. Two of these retaining stitches may be introduced close together, if necessary. The edges of divided skin, along with the deeper muscular tissues, including that part which recently formed the outer end of the affected eyelid, are simply stitched together with a continuous fine silk suture.

No dressing other than a repeated dusting with dermatol need be used. It is well, however, to wash out the conjunctival sac regularly, which can be done with a lachrymal syringe, its point being gently inserted between the edges of the eyelids. The silk stitches may be removed in six days' time, the silver ones being left in for five or six days longer. So far as I have noticed, there is never any puckering apparent beyond the newly formed canthus, and the small linear cicatrix is lost amongst the other lines often found there. In those cases where the condition of ectropion is extreme, and caused by cicatricial contraction of skin, etc., I have always found it necessary to resort to transplantation of skin from adjacent or distant parts, which, of course, is always somewhat tedious to do."

THE USE OF CICATRICAL SKIN FLAPS IN THE OPERATION FOR ECTROPION OF THE UPPER LID.

BY F. C. HOTZ, M. D., CHICAGO, ILL.

Journal of the Am. Med. Assoc., Sept. 19, 1896.

An abstract of Dr. Hotz's paper appeared in the July number of the Annals (p 731), in the Report of the Proceedings of the Ophthalm. Section of the Am. Med. Assoc., meeting at Atlanta, May, '96.

PULSATING EXOPHTHALMOS.

BY WALTER RIVINGTON, B. A., M. B. AND M. S. LOND; F. R. C. S., ENG.

The Lancet, June 6, 1896.

This paper is a reply to Mr. George E. Walker's article, "Pulsating Exophthalmos—a Plea for Early Ligature" (The Lancet, Jan. 27, '94). The writer does not concur with some of Mr. Walker's opinions on the pathology and treatment of this affection. "Pathologically, Mr. Walker's main contention appears to be that, with the exception of some traumatic cases, caused by the perforation of the carotid artery within the cavernous sinus by a stab with a pointed weapon or a splinter of bone, these cases of pulsating exophthalmos are due to aneurisms (I do not know whether he means circumscribed or fusiform aneurisms, or both), and that such aneurisms, before they have become ruptured, are adequate to produce all the characteristic symptoms of intra-orbital aneurism. Now this, I believe, is exactly what a circumscribed or a fusiform aneurism of the internal carotid artery in the cavernous sinus is capable of doing, so long as it remains entire. It is not until the artery or the aneurism ruptures and the arterial blood from it is pumped into the sinus, and so driven along the veins of the orbit that the characteristic symptoms of 'intra-orbital aneurism' commence. An aneurism of the internal carotid in the cavernous sinus or of the ophthalmic artery at its origin may produce pressure symptoms affecting particular nerves (third, fourth, fifth or sixth), symptoms of obstruction to the return of venous blood, such as oedema of the lids, and conjunctiva, hazy, ulcerated corneæ, or injection of the sclerotic and conjunctiva, but not the typical symptoms of intra-orbital aneurism. After the most careful examination of the evidence afforded by all the published cases known to me, I stated the conclusions at which I had arrived in my article in Heath's Surgical Dictionary (1886) as follows:

"1. Beyond question the great majority of the traumatic cases have been instances of endocranial arterio-venous com-

munications due to wound or rupture of the internal carotid artery in the cavernous sinus. 2. Beyond question, the great majority of the idiopathic cases have been instances of endocranial arterio-venous communications due to a rupture of an aneurism of the carotid, or of an atheromatous carotid in the cavernous sinus. 3. The occurrence of a circumscribed aneurism of the ophthalmic artery or one of its branches, as a cause of the same symptoms as were exhibited in the cases of arterio-venous communication, rests at present solely on the laconic report of Guthrie. Moreover, aneurism of the ophthalmic artery in the orbit is a very rare affection. The first two conclusions have been accepted, save by Mr. Walker, by surgeons and writers who have published cases since my paper was written. The third, so far as evidence is concerned, now requires some modification; because, on Sept. 18th, 1886, Dr. Dempsey, of Belfast, published an extremely interesting and instructive case in which, combined with a fusiform aneurism of the carotid artery in the cavernous sinus, there was an immense saccular aneurism on the upper part of the ophthalmic artery, capable of holding a mandarin orange. The carotid artery was tied, but the aneurism of the ophthalmic artery burst into the eyeball, and profuse haemorrhage from the cornea and secondary haemorrhage from the ligatured artery proved fatal on the forty-first day."

Mr. Rivington briefly summarizes the twelve cases referred to by Mr. Walker, and says: "The foregoing cases certainly lend no kind of support to Mr. Walker's view that ordinary aneurism of the carotid artery in the cavernous sinus, and not arterio-venous communication, is the usual cause of the group of symptoms known as 'intra-orbital aneurism.' He does not adduce the results of post-mortem examinations to prove his contention, but relies entirely upon arguments which, in the face of the sudden onset of the symptoms; often with noise in the head, and the venous pulsation, and in the face of the pathological evidence in our possession demonstrating traumatic arterio-venous communications, and in idiopathic cases, ruptured aneurism, or aneurism of the ophthalmic artery in the orbit, and one or two instances of venous obstruction, I do not think it necessary to follow for the purpose of further refutation."

Concerning treatment, he says: "There is one other observation of Mr. Walker in regard to my case to which I must allude. He speaks of temporisers resting their case on mine,

but he omitted to mention the fact that I wrote strongly in favor of ligature, and never advocated delay. From my own experience and the consideration of other cases, I am disposed to agree with Mr. Walker—although not on the pathological grounds which he advances—that early ligature is, as a rule, the best treatment. Light may not always be restored after ligature, but I think it will in the generality of cases, and that early ligature offers the best and surest method of preventing impairment of vision. Leaving the case to itself may occasionally be followed by a spontaneous or accidental cure or some diminution in the severity of the symptoms, but generally the condition either remains stationary, or becomes exacerbated with great impairment or loss of sight. Whilst objecting, therefore, to Mr. Walker's pathological doctrines, which appear to me to be heretical in the extreme on this subject, I am glad that I am in the main in accordance with him on the cardinal topic of the best form of treatment. Since the time of Mr. Nunnely, who did so much to advance our knowledge of the pathology of this interesting form of aneurism, no one has had so large a clinical experience of cases exemplifying it, as Mr. George Walker, and I cannot but heartily congratulate him on the fact that the successful results of his operations have prevented him from having the opportunity of seeing for himself that his view of the pathology of the affection is entirely unsupported by the actual conditions demonstrated by post-mortem examination."

THE COURSE AND PROGNOSIS OF ORBITAL TUMORS AS INFLUENCED BY SURGICAL OPERATIONS FOR THEIR REMOVAL.

BY CHARLES STEDMAN BULL, M. D., NEW YORK.

New York Med. Journal, Aug. 29, 1896.

"For some years past the attention of the writer has been turned to a consideration of the prognosis of orbital tumors, whether primary or secondary, as influenced by surgical interference, with special reference to the frequency of return of the tumor, and the rapidity of its growth. Such knowledge as the writer may have gained on the subject has come almost entirely from his own experience; for ophthalmic literature is well-nigh silent on the subject. . . In considering briefly the increased rapidity of growth of malignant tumors of the orbit after surgical operations for their removal, it will be convenient to divide these tumors into three classes viz.: 1. Tumors which primarily were intra-ocular, and which had invaded the orbit secondarily. 2. Tumors which originated in the orbit, whether

in the cellular tissue or in the periosteum of its bony walls. 3. Tumors which originated in the bones or sinuses adjacent to the orbit, and involved the orbit secondarily."

After discussing the course and prognosis of each of these varieties of orbital tumors, the writer expresses the following conclusions:

"1. The prognosis of all forms of malignant orbital tumors, whether primary or secondary, is unfavorable; and if the tumor is primarily in one or more of the deep facial bones or their sinuses, the prognosis is positively bad.

"2. Except in the case of encapsulated tumors of the orbit, surgical interference is almost invariably followed by a return of the tumor, and the growth of the secondary tumor is more rapid than that of the primary lesion. With each succeeding operation, the period of quiescence in the return of the tumor grows shorter, and the rapidity of the growth increases.

"3. The patient's family, and in certain cases the patient himself, should, in the beginning, be told of the serious nature of the trouble, and be warned that complete removal of all the disease germs is a well-nigh hopeless task. The burden of the decision as to surgical interference must rest upon the shoulders of the patient.

"4. Repeated operations in these cases undoubtedly shorten the life of the patient. While it is, therefore, our duty to operate in all cases in order to relieve severe or unbearable pain, we should be slow to operate merely for the sake of relieving, temporarily, physical disfigurement or deformity, especially if we are convinced that by so doing we shorten the life of the patient, even if that shortened life is rendered more bearable to him."

TENSION IN CASES OF INTRA-OCULAR GROWTH.

BY C. DEVEREUX MARSHALL, ENGLAND.

Report of the July, 1896, meeting of the Ophthalmological Society of the United Kingdom. *British Med. Journal*, July 11, 1896.

With a view of further elucidating the causes of glaucoma in cases of intra-ocular neoplasms, 100 cases had been examined, including 53 in which the choroid only was affected, 28 in which the ciliary body or iris was involved, and 19 in which a glioma of the retina existed. After grouping and analyzing these cases, he arrives at the conclusion that the vast majority of these cases prove the rule that the intra-ocular tumor bears a direct relation to the condition of the angle of the anterior

chamber, and also that it is by no means uncommon to have normal or even diminished tension in eyes containing new growths. There are one or two exceptional cases in which the tension is increased when the angle is open, and normal or diminished when the angle is closed; but these are all complicated by a gross affection of the ciliary body, leading either to a considerable diminution of its normal functions, or else probably to the opening of secondary channels through which fluid can escape from the globe.

SPONGE GRAFTING IN THE ORBIT FOR SUPPORT OF ARTIFICIAL EYE.

BY E. OLIVER BELT, M. D., WASHINGTON, D. C.

Medical News, June 27, 1896, and Ophthalmic Record, September, 1896.

This paper was reported in full in the July, '96, number of the Annals; see the Report of the Proceedings of the Ophthalmological Section of the American Medical Association meeting, at Atlanta, May, '96 (page 740).

ON THE EMPLOYMENT OF ELECTROLYSIS IN THE TREATMENT OF DETACHED RETINA.

BY SIMEON SNELL, F. R. C. S. E., SHEFFIELD, ENG.

Report of the July meeting of the Ophthalmological Society of the United Kingdom. British Med. Journal, July 11, 1896.

Mr. Snell stated that the recent discussion at this society indicated that the treatment of detached retina was still regarded as unsatisfactory. Occasional good results were doubtless obtained. A patient he operated upon many years ago by sclerotic puncture was, he understood, following his occupation, and was dependent upon that eye. He alluded to Terson's advocacy of electrolysis in detached retina. Mr. Snell had employed it in three instances. The first in a hopeless case, simply to test the method, but the detachment was reduced; the second, an extensive detachment had been materially improved in lessening the detachment, increasing the size of the field, and considerably improving the vision; and a third resulted in a practical disappearance of the detachment, a much enlarged field, and also in improvement in vision from fingers indistinctly to 15-100. It was too early to state the final result, yet Mr. Snell thought the method was worthy of trial.

THE TREATMENT OF CORNEAL OPACITIES BY ELECTROLYSIS.

BY DR. EDGAR STEVENSON, OF LIVERPOOL.

The Lancet, Aug. 8, 1896. Report of the 1896 meeting of the British Medical Association.

The frequency of corneal opacities and the very disappointing results obtained by the use of stimulating ointments, rendered this subject of interest to all engaged in ophthalmic practice. Dr. Stevenson had seen the method of electrolysis practiced by Dr. Adler. He had, however, modified Dr. Adler's process by using much weaker currents and a different terminal with much success. He used a current of $\frac{1}{4}$ to $\frac{1}{2}$ milliampere, with a pressure of 3 volts; the anode was placed on the cheek of the opposite side; the kathode consisted of a smooth silver probe which was applied to the nebulous cornea. He urged that the kathode should be gently moved over the surface of the nebula the whole time, and that the utmost care should be taken that the current never exceeded $\frac{1}{2}$ milliampere. An ampere-meter and a rheostat should always be used in order to register and regulate the amount of current passing. Some slight frothing, due to electrolysis, would occur. Notes were then read of some old-standing cases which had long been treated by stimulating ointments without success. The improvement under electrolysis was marked in all of them. Finally he urged that not more than fifteen applications should be made consecutively, as if that limit was much exceeded, the cornea tended to become soft and its curvature might be altered.

FORMATION OF AN ARTIFICIAL PUPIL BY EXTRA-OCULAR IRIDOTOMY.

BY J. B. LAWFORD, F. R. C. S. E., OF LONDON.

The Lancet, August 8, 1896. Report of 1896 Meeting of British Medical Association.

This operation was devised by Schöler to avoid the difficulties and risks of De Wecker's intra-ocular iridotomy. A corneal incision was made with a keratome; the pupillary margin was picked up by special iris forceps with milled, not toothed, extremities, and gently drawn outside the corneal wound. The iris was then divided by one stroke of the scissors in a direction at right angles to the pupillary margin. The iris was then, with the utmost care, replaced within the eye. The artificial pupil formed was small, wedge-shaped, its apex pointing towards the periphery.

SQUINT UP TO DATE.

BY CHARLES BELL TAYLOR, M. D., F. R. C. S., EDIN.

The Lancet, Sept. 12, 1896.

This paper is, to a great extent, a criticism of Landolt's well-known views on the management of cases of strabismus, especially his preference for advancement over tenotomy. The article contains the following paragraph concerning divergent squint:

"With regard to cases of divergent squint, I have endeavored to simplify the ordinary, complicated and somewhat formidable operation, by merely shortening the internal rectus without interfering with the external. This is easily done by catching up the tendon on a hook, exposing it, and freely separating its attachment to the sclerotic. I then seize the tendon with forceps, and by two horizontal snips, convert it into a narrow strip; the base of this strip is then transfixed by a needle armed with a thread; half an inch or more of muscular and tendonous tissue is cut off, and a firm attachment to the sclerotic immediately over the inferior rectus tendon is secured by perforation with a needle attached to the other end of the thread (the conjunctiva is often so defective that it gives no support to stitches, therefore I suture the muscle to the tendonous insertion); the two ends of the ligature are then carefully drawn together while the eyeball is turned inwards. Any amount of inversion may be thus obtained. Only one suture is required. General anaesthetics may be dispensed with, and the operation admits of rapid execution. Of course, the external rectus may be advanced in obstinate cases of internal squint, or such advancement may form the first step of the operation, as is the practice of Professor Landolt; but it is useless, so far as my experience goes, to attempt to diverge the eye by advancing the external rectus, unless you at the same time weaken *par recul* the internal rectus, and if you do weaken *par recul* the internal rectus, you will very seldom find it necessary to resort to advancement of the external rectus. It appears to me, therefore, that Prof. Landolt's suggestion is to be deprecated; first, because he proposes to substitute in all cases of convergent squint, a difficult and somewhat complicated operation for one which is very simple, and which admits of instant execution; secondly, because the external rectus, from its comparative length, tenuity and diffuse attachment to the globe, is peculiarly unfitted either for advancement or resection; and thirdly, because any effect that advancement of the external rectus may have as an adjuvant to

tenotomy of the internal in cases of convergent squint, is more readily attained by simply fixing the eye outwards with a suture without interfering with the external rectus at all, and of course without any open wound."

FOREIGN BODIES IN THE INTERIOR OF THE EYE.

BY W. A. FISHER, M. D., OF CHICAGO, ILL.

Medical Record, August 22, 1896.

The writer reports two cases of foreign bodies (iron) in the eye, and concludes with the following advice in such cases: "If one is sure of having a piece of metal in the eye, and the media are not clear but are without serious inflammation, it is well to wait for the media to become clear. If there is serious inflammation and the media are not clear, nothing will be gained by waiting.

"The results of magnet operations are very various so far as vision is concerned. Many patients who are reported as having good vision are reported too soon, but enough successful cases are reported to justify us in using the magnet, in recent cases. When the metal is in the anterior chamber, the results are nearly always satisfactory. In removing from the anterior chamber metal that has become embedded in the iris, it is best to use a flat, blunt electrode. The electrode should be introduced in the anterior chamber and the metal dislodged before connecting the current. The foreign body having been dislodged, the button on the handle of the electrode may be touched and the metal removed, thus preventing prolapse of the iris.

"Churning of the vitreous is to be avoided. Cocaine is as good as profound anaesthesia in adults. Thick, blunt electrodes are to be preferred to thin, pointed ones.

"Air bubbles are always a sure sign of foreign bodies in the eye.

"Sometimes a piece of metal can be located by passing the electrode over the sclera. The patient will complain of pain only as the instrument passes over the metal. It is useless to probe for foreign bodies in the vitreous.

"It is not wise to try to remove a foreign body from the interior of the eye through the opening made by its introduction. It is better to make a larger opening and avoid introducing the instrument so many times.

"In conclusion I will say that the possibility of preserving the globe, and often useful vision, warrants us at all times in using the magnet in all cases in which metal is in the interior of the eye."

SUBCONJUNCTIVAL INJECTIONS.

BY EDWARD J. BERNSTEIN, M. D., BALTIMORE, MD.

The Ophthalmic Record, September, 1896.

Although unfavorably impressed with this method when first brought to his notice, the author has become an advocate of its use in certain cases under certain well-defined conditions: 1. By use of cyanide of mercury (1 to 3000) in one per cent. cocaine solution; 2. observance of thorough antisepsis; 3. cocainizing conjunctiva; 4. injecting subconjunctivally, and not under Tenon's capsule, and at least one cm. from the limbus, holding the needle at a tangent to the globe; 5. avoiding large blood-vessels of conjunctiva (this is facilitated by rubbing lid over globe once or twice, when the larger vessels come into view). Under these conditions the injections can be made with little or no pain, or danger to the cornea, or formation of adhesions between sclera and conjunctiva.

He criticises unfavorably the assertion of Muttermilch, that but one-third of the fluid injected enters the eye, as not founded on fact; also the assertion that the action of drugs instilled into the conjunctival sac is so intense or so rapid as when injected; he contends that instillation is not so exact a method of dosage as is injection. He has proved that mercury, when injected, enters the eye, and cites the experiments of Knies, Ovis and Pflueger, Bucchi, Carl Mellinger and Bossalino, to substantiate this statement. Although he believes the main action to be by stimulation of circulation in lymph channels, he prefers mercury cyanide to sodium chloride, agreeing with Gepner that the former gives better results. Subconjunctival injections must never be understood as intended to supplant general and other local treatment, but rather as a potent aid to them.

The adverse criticism of Mellinger, Gutman, Haab and others, he believes, cannot be taken seriously, since their practical experience in this line has not been sufficient when contrasted with the eight years' work of Darier, the 2000 injections of Deutschmann, and the great number of cases treated with more or less success by Gepner, Schmidt-Rimpler, De Schweinitz and others. He reports cures in two cases of hypopyon keratitis, one case of plastic iritis in which he had to resort to iridectomy

in the eye first affected, but was able to overcome synechiae in the second eye after four injections. He had a negative result in a case of optic nerve atrophy of doubtful origin, and in one case of choroiditis disseminata. He had hastened cures in two cases of toxic amblyopia and has now two cases of detachment of the retina under treatment with some signs of improvement.

**CONCERNING SUBCONJUNCTIVAL INJECTIONS OF SODIUM CHLORIDE
VERSUS MERCURIC CHLORIDE IN VARIOUS OCULAR
DISEASES, WITH CASES.**

BY CLARENCE A. VEASEY, A. M., M. D., PHILADELPHIA, PA.

American Journal of Ophthalm. September, 1896.

"Notwithstanding the great amount of literature concerning subconjunctival injections of mercuric chloride in various ocular affections that has been produced within the past few years, the subject is far from being settled, as there still exists much difference of opinion among ophthalmic surgeons, as to their value, indications and methods of action.

"It is claimed by many, that the good effects that are obtained in certain selected cases, are produced by mercury (though exceedingly small in amount) coming directly in contact with the diseased process in the eye, without having to go through the whole system. This seemed very plausible at first, and especially so after Pflueger claimed to have found the drug in the tissues of eyes enucleated some time after injections had been made. On the other hand, some competent observers have failed to confirm Pflueger's experiments. This gave rise to reasonable doubt as to the mercury alone causing the beneficial effects that have been obtained, so in certain cases, simple distilled water was employed instead of a mercurial solution. The great drawback to the latter method was the severe pain that followed each injection, so a solution of sodium chloride was then tried. This gave rise to no pain, and in the cases in which it was used, produced fully as good results as did the mercurial solution. The fact that injections of distilled water do good but cause considerable pain, and that injections of a solution of sodium chloride also act beneficially but give rise to no pain, disproves the opinion that in the injection of solution of mercuric chloride it is the action of the mercury alone that produces the good results, and goes far toward proving the theory that these good results are produced by the unblocking, as it were, of the engorged and sluggish lymph channels."

The writer then recites the histories of nine cases treated with subconjunctival injections of sodium chloride solution. He considers the following conclusions justifiable:

"1. Subconjunctival injections of solutions of sodium chloride produce equally as beneficial results in the treatment of ocular affections, as do subconjunctival injections of solution of mercuric chloride.

"2. The good results obtained from subconjunctival solutions of mercuric chloride, are not due to any specific action of the minute amount of mercury that may come in contact with the inflammatory process, but probably to the unblocking of the engorged lymph channels.

"3. Subconjunctival injections of solutions of sodium chloride are of the greatest value in treating iritis, especially in checking the severe pain, relieving it, generally, in a very short time after the first injection is made.

"4. Subconjunctival injections of solution of sodium chloride produce less discomfort than similar injections of solution of mercuric chloride, and never cause any adhesion between the conjunctiva and sclera which so frequently follows injections of the latter.

"5. Subconjunctival injections of solution of sodium chloride are of much value in producing the rapid absorption of subconjunctival hemorrhages, which, as it is well-known, are removed, as a rule, only by time.

"Note.—Recent investigations on animals' eyes by Geering, of Basil, show that in almost all cases in which there have been given subconjunctival injections of mercuric chloride, there are found, on microscopical examination, numerous adhesions between the periphery of the iris and the cornea in the region of the filtration angle. In no one of his experiments did he, however, get a glaucomatous rise of tension, though this possibility should be remembered. Whether subconjunctival injections of the salt solution will produce similar adhesions, remains to be determined by further experiments."

GONORRHOEAL CONJUNCTIVITIS; ITS TREATMENT.

LOUIS J. LAUTENBACH, A. M., M. D., PH. D., PHILA., PA.

Journal of the Am. Med. Assoc., September 19, 1896.

This paper appeared in the July number of the *Annals* (p. 747), in the Report of the Proceedings of the Ophthalm. Section of the Am. Med. Assoc. meeting at Atlanta, May, '96.

SCLERITIS.

BY WILLIAM GEORGE SYM, M. D., F. R. C. S. E., OF EDINBURGH.

American Journal of Med. Sciences, July, 1896.

In a brief paper the writer points out a few peculiar circumstances connected with scleritis, from a strictly clinical point of view. "The persons liable to be affected with scleritis belong to two classes: (1) women either at the beginning or the close of their menstrual history, just on which occasion there is frequently a certain amount of irregularity of function; and (2) persons, whether men or women, who are of rheumatic family. I say 'persons of rheumatic family' rather than 'rheumatic persons,' because, so far as my experience goes, I have found scleritis not so much among those who actually themselves suffer from declared rheumatism, as among those whose parents or other near relatives have so suffered. (Other causes, though decidedly less frequent, are gout and syphilis.) These two facts of liability—the menstrual and the rheumatic diathesis—seem to me to point in the direction of a chemical irritant cause, and so, too, do certain other facts in connection with scleritis."

The writer then speaks of the portions of the sclerotic most liable to inflammation, explaining the predisposition of certain areas as due to exposure, and vascular arrangement of the sclero-corneal junction. He mentions the differences in gravity of the mild and severe forms of the disease. He concludes his paper with the following remarks concerning treatment:

"In respect, also, of the treatment appropriate to the condition, scleritis presents a peculiarity, for, speaking generally, the less local treatment is employed, the better. Personally, I seldom enjoin any local application beyond bathing with a warm or lukewarm bland lotion. In more sluggish cases, massage with a mild mercurial ointment seems to do good, but should be used with caution. Atropin is only useful where complication exists in the way of inflammation of iris or ciliary body, and in view of the possibility of the tension rising and the weakened coats yielding, the effect of the atropin also must be anxiously watched, and a myotic substituted if necessary. Some have obtained benefit from subconjunctival injection of mercurial lotions, and even of water; I have, in a few cases, in which the vascular injection and the swelling were persistent and severe, obtained good from the operation of peritomy, either locally or all around the cornea. But it is really on internal medication that reliance has to be placed, local treatment being quite secondary in importance and value, except,

perhaps, as applied to the complication. It is not necessary in this article, to mention all the remedies which are employed, and to do so would take me outside the intended lines of this article; but I should like to direct attention to a mode of treatment which has not obtained the place in the estimation of the profession to which I think it is entitled, viz., subcutaneous injection of pilocarpin. The method of carrying this out which I prefer, is to let the patient have a walk in the fresh air in the morning; dine lightly on fish or chicken with vegetables, but no meat, about 1 o'clock; to retire to bed, lying in flannel, at about 4 p. m., at which time I administer an injection into the arm of about one-tenth to one-sixth of a grain, according to what I find the patient can well stand. The patient remains in bed for three to four hours, perspiring, and then cooling down, during which time a cup of tea is allowed; then the patient is permitted to get up, takes a slight warm bath, changes the clothes entirely, and may stay up in a warm room for a few hours; he takes a light milk supper, and, according to circumstances, sleeps in a different bed, or, at all events, in thoroughly dry bedding. I do not claim in the least to have myself discovered the virtues of pilocarpin in such cases—it is mentioned in Landolt and De Wecker's *Traité d'Ophthalmologie*, and elsewhere—but I do think it is deserving of more attention than it receives at present in the treatment of obstinate cases of scleritis."

BACTERIA AND OPHTHALMIC SURGERY.

BY F. M. WILSON, M. D., BRIDGEPORT, CONN.

Medical Record, May 30, 1896.

"The relation of bacteria to operative eye work is a question which none of us can avoid. Not only are bacteria in the air, but facts and theories about them are 'in the air' also, and this question is too practical to be ignored." Dr. Wilson considers this subject along three lines: (1) laboratory work, (2) practical surgical work, not ophthalmic, and (3), practical surgical work upon the eye.

A study of laboratory evidence leads him to accept as facts "(1) that the bacteria are present in great numbers and considerable variety; (2) that the aureus at least can produce supuration of the globe; and (3), that suppuration can be produced without bacteria, notably, by the metals, mercury and copper.

"Turning now to our special field of work, let us frankly ask this question: What have the bacterial theories, and what have

methods of dealing with bacteria, done for ophthalmic surgery? Let us see. Plastic operations about the eye involving the use of large flaps, either with or without a pedicle, are undoubtedly much more successful now than formerly, and I think no one will deny that this increased success is due in large measure to the more vigorous exclusion of bacteria from the field of operation. Plastic operations of less extent, like those for some of the milder forms of ectropion and entropion, usually heal kindly, whether anti-bacterial measures are used or not, and even if a stitch-abscess forms, it does not usually interfere with the success of the operation. . . . The operators of twenty years ago were as much surprised to have suppuration follow iridectomy as we are to-day. And, lastly, the average percentage of loss after cataract extraction is practically the same now as before the introduction of anti-bacterial measures, viz., about six per cent.

"Assuming, then, that very little has been accomplished for cataract surgery by anti-bacterial measures, what theoretical explanation can be offered, first and foremost, that the operation was so successful, before we knew that the bacteria were there? The strongest force which works against the injurious influences of bacteria upon the eye, is probably the natural and not the artificial one, and the natural protection is probably due to a combination of conditions, rather than to any one thing. The risks from hands and instruments are, of course, less than in most of the operations in general surgery. Just why the bacteria of this field of operation do not oftener reach and infect the corneal wound is, with our present knowledge, entirely a matter of speculation. The mechanical conditions surrounding the cataract wound are unique. As long as the wound remains open, a gentle stream of aqueous humor flows out, and whatever goes in, must swim against the stream; and after the wound is closed, if there is any current of tears, it is away from the wound if the section is upward. Chemically, the influence of both aqueous humor and tears, if not proved to be decidedly adverse, is at least not especially favorable to the growth of bacteria.

"A second reason why more has not been accomplished is the difficulty and danger of using the more efficient of the anti-bacterial measures about the field of operation. Sterilization of the hands and instruments, though not so necessary, can, of course, be done as thoroughly by the ophthalmic as by the general surgeon. But sterilization of the field of operation in

cataract extraction is a practical impossibility. The skin of the lids offers many obstacles to the removal of bacteria from the loose folds. The eyebrows and eyelashes simply cannot be rendered sterile. The deeper recesses of the conjunctival sac can neither be scrubbed, nor is it safe to use the stronger of the antiseptic solutions. The solutions used in ophthalmic surgery, while by the laboratory tests they may be within the area of killing power, are never very far within it, the experiments always being to find the weakest solution that will kill. And after all has been done and the dressings are on, the lachrymal passages still communicate with the nose."

REMARKS ON THE MANAGEMENT OF GLAUCOMA.

BY LEARTUS CONNOR, A. M., M. D., DETROIT, MICH.

Journal of Am. Med. Assoc., August 29, 1896.

Dr. Connor shows that "the literature of glaucoma is honey-combed with doubt and contradiction," and points out some of the reasons for this. He speaks of the predisposing causes, and discusses the treatment, prophylactic, by eserine and by iridectomy. His conclusions are:

"In the management of glaucoma, such attention should be given the bowels, skin and kidneys, as to secure the most prompt and complete elimination of the effete tissue metamorphosis. The diet should be so regulated as to admit only such articles and in such quantities as can be perfectly digested. The liberal use of water internally and externally, greatly assists in restoring the fluids of the body to a state of reasonable purity. The continuance of such diet and mode of life affords the largest hope of preventing future glaucomatous attacks. Such medicines should be employed as are called for to remove the constitutional dyscrasia found in each case, as arthritic, gouty, syphilitic, etc.

"In simple glaucoma, with no increase of tension, such treatment may suffice; but should there develop increased tension, diminished visual field, pain, shallowed anterior chamber, myotics should be first employed (if they can be constantly watched), and if they keep the symptoms under control, nothing farther is called for. But if they are not well borne, or if at the end of a month the visual field has diminished, then an iridectomy should be done. If the tension still persists, a sclerotomy should be performed and myotics again employed.

"In acute inflammatory glaucoma, the tension must be promptly reduced by general treatment and myotics, if pos-

sible, but if these do not act immediately in reducing the ocular tension and in keeping it reduced, an iridectomy must be promptly done.

"Sub-acute glaucoma is managed along the same lines as the acute, except that operative action may be delayed a longer time, though the rule should not be deviated from which demands an iridectomy in all cases that grow worse under general management and myotics.

"Chronic glaucoma is managed in the same manner as the sub-acute, except that iridectomy is contraindicated in cases of degeneration of the iris, the results of the operation in such cases being unfavorable.

"Absolute glaucoma is treated only to relieve pain; if salicylate of soda fails, the treatment is exclusively surgical, sclerotomy, iridectomy and enucleation.

"Hemorrhagic glaucoma is rarely benefited by any operation, owing to the weakened condition of the blood-vessels within the eyeball. Hence, if general and local medication fail, and pain persists, enucleation is the only resource.

"Secondary glaucoma calls for specific treatment according to the condition inducing it: If it be an intra-ocular tumor, enucleate the eye; if it be lens swollen from discission, extract the same, and so through the list.

"Finally, he who would do the most for a case of glaucoma, must not only be able to quickly detect the disease in the form of its acute exacerbation, to apply the local remedies, or do the operation which will quickest and surest restore the normal intra-ocular currents, but he must be able to recognize the constitutional dyscrasia underlying such acute attack, and put in operation the wisest measures for its mitigation or removal."

THE ACTION OF HYDROBROMATE OF SCOPOLAMINE UPON THE IRIS AND CILIARY MUSCLE.

BY CHARLES A. OLIVER, A. M., M. D., PHILA.

Amer. Journal Med. Sciences, September, 1896.

As the result of a single instillation of 1-480 grain of hydrobromate of scopolamine, Dr. Oliver obtained mydriasis in 18 minutes, remaining ad maximum from 24 to 30 hours, the diameter of the pupil becoming normal in about 72 hours—ciliary paralysis in 23 minutes, maintained from 24 to 36 hours, total re-establishment of the power of the ciliary muscle taking place in about 96 hours.

"During the course of the experiments with the drug, it was noticed: 1. At the beginning of a few of the examinations there

was a slight sense of conjunctival astringency, which in a couple of instances amounted to a stinging sensation. 2. There were no appearances of constitutional disturbances, care, however, having been taken in every instance, to prevent the passage of any of the liquid into the lachrymal passages. 3. In no instance was any apparent increase of a choroidal disturbance produced by the employment of the drug used.

"Conclusions: 1. The early and complete paralysis of the ciliary muscle that can be obtained by the single instillation of 1-480 grain of hydrobromate of scopolamine, and the rapid and full return of the action of the muscle, render this drug in this amount the most efficient and the most valuable cycloplegic that can be used for the proper determination of the total amount of ametropia. 2. The comparatively rapid return of the full dilatation of the pupil produced by the single instillation of 1-480 grain of hydrobromate of scopolamine to normal pupillary width, renders the drug in this strength less objectionable than those drugs which, by reason of necessarily greater strengths, to afford proper cycloplegic work, must be employed in amounts that give more permanent mydriasis. 3. The perfect freedom from injurious constitutional effects when 1-480 grain of hydrobromate of scopolamine is used, renders the drug in this amount absolutely safe for employment in all cases in which total cycloplegia becomes necessary."

SOME SUPPLEMENTARY REMARKS ON SCOPOLAMINE AS A MYDRIATIC.

BY ARTHUR G. HOBBS, ATLANTA, GA.

Ophthalmic Record, September, 1896.

"I have stated in my former papers that scopolamine hydrobromate occupies a middle ground between atropia on the one hand, which is known to produce a complete paralysis of accommodation and retain its effects for a week or ten days, and homatropine, which is claimed by some, and denied by others, to effect a complete control of the accommodative muscles and retain its effects about three days.

"In the first case, the time necessary to accomplish a full paralysis ranges from two and a half to three and a half days; and in the second, ninety minutes to two hours, according to its advocates. But if a one-twentieth per cent. solution of scopolamine be used with intervals of fifteen minutes between the instillations for one hour, the full effect is reached quite as completely as that produced by a three days' use of atropia, and the paralysis only lasts from one and a half to two days.

"At first, I used scopolamine in a solution of $\frac{1}{2}$ grain to the ounce, but now I use it in much weaker solutions. It should be dropped at intervals of ten to twenty minutes on the cornea, until four, or at most five installations have been made, when it may be assumed that a complete paralysis of the accommodative muscles exists.

"In simple refractive cases, I prefer it to atropia always, because it does its work much more quickly, while its decline is at the most only about one-fifth, and oftener only one-sixth, of the time required by atropia, and accommodation is restored within a day and a half or two days after its instillation. If the patient is a business man who can afford but little time, a weak solution of eserine (one-eighth of a grain to the ounce) may be used to more rapidly reduce the pupil. Scopolamine produces no unpleasant effects in the throat, as does atropia. I now use it in a weak solution in cases of glaucoma, with very small pupils, if a larger pupil for any reason is desired; for example, to more thoroughly examine the retina and media. In some cases of iritis, when atropia has failed to produce sufficient dilation of the pupil, I have found that a solution of scopolamine accomplishes the object well in the few cases in which I have resorted to it for this purpose. The pupil will become dilated one-half, if a 1-30000 of a grain be properly dropped on the cornea, and 1-15000 of a grain will dilate it to its full extent under the same conditions.

"Although scopolamine has had six or seven clinical articles written upon it since I read my second paper on its uses before this Association, one year ago, yet almost nothing, from a clinical standpoint, had been written on the subject before that time. Each of these articles which have appeared during the past year, honored me by referring to my papers as the only clinical contributions on the subject up to that date.

"During the past year I have continued the use of this new mydriatic, and during this time no toxic symptoms have been manifested under its use except, perhaps, in a half dozen cases, and in these there was merely a slight indication of constitutional effects. I use it now, most frequently in a 1-20 per cent. solution, and often in only a 1-40 per cent. solution; occasionally for some special reason (such, for example, in a case with the history of a former resistance), I will use it as strong as 1-10 per cent. My basic solution from which I can make all others (except the rare 1-10) is 1-20 per cent. strong. I use the weaker solutions with as few restrictions as I would use boracic

acid barring an unnecessary dilatation of the pupil. It produces no increase of tension, and hence the old eye, even if it be glaucomatous, does not restrict its use, as in a greater or less degree it would bar all other mydriatics.

"Hydrobromate of scopolamine is as sure of producing a complete effect in sixty to ninety minutes as is atropia in two or three days, and it persists, at most, only until the third day, and oftener only two instead of a week or ten days. For this very reason atropia is often preferable, but never for refraction purposes pure and simple, where scopolamine will, I think, finally gain a place above all other mydriatics.

"This most potent of all drugs has been used constantly in my refraction room for three years, and I have learned to like it better and better each year as I learn to respect its great potency."

A CASE OF POISONING BY SCOPOLAMIN.

BY MATTHIAS L. FOSTER, M. D., NEW YORK.

Medical News, Sept. 12, 1896.

"A young laboring man, who had been treated for a considerable time for a mild form of trachoma, was found to be astigmatic, and it was decided to be advisable to examine him under the influence of a mydriatic. Scopolamin was chosen, and four instillations of a one-fifth of one per cent solution were made in each eye, at intervals of ten minutes. Fifteen minutes after the last instillation, a little over an hour after the first, the patient complained of dizziness, and was obliged to lie down. This was followed by dryness of the throat, nausea and attempts to vomit, flushing of the face, decrease in the strength and increase in the rapidity of the pulse, symptoms which increased with alarming rapidity for half an hour, and reached their culmination in about two hours. At the end of half an hour the pulse was over 160 per minute and very weak, the face was growing darker, until it became mildly cyanotic; the patient was unconscious and wildly delirious. The muscles of the extremities were frequently and strongly convulsed. When at the worst it took the strength of several men to hold him, and some doubt was expressed by the gentlemen gathered about him, whether his struggles were the result of the active delirium which was present, or due to spasmodic contractions of the muscles from the irritation of the drug. The pharyngeal muscles appeared to be in a state of paresis. These symptoms began to abate in about two hours, under energetic treatment with morphine and whiskey, and the improvement progressed

so rapidly that the patient was able to leave the hospital and walk home ten hours after the first instillation. Nausea and dizziness persisted for a day longer. The recovery from the mydriasis was in the usual time.

"It should not be inferred from such a history as this that scopolamin is too dangerous a drug to use, but it should be understood that it is too dangerous a drug to use without proper care and precaution. Certain individuals are, without doubt, more susceptible to its influence than others, and the rapidity of its action suggests a way in which it may be possible to avoid giving an overdose. The observations, in regard to its effect upon the ciliary muscle, show that the time necessary for complete paralysis varies from ten to sixty minutes, and that the quantity of solution, of the usual strength required to produce this effect, is from one to five drops; hence it is wise to test the accommodation before the second and all succeeding instillations to avoid the unnecessary use of the drug after the ciliary paralysis is complete. Another practical precautionary measure is to occlude the tear-ducts by means of pressure by the patient's finger as soon as a drop has been instilled into the conjunctival sac. This prevents the passage of the solution through the lachrymal membrane. When these two precautions are observed, the danger of poisoning is reduced to a minimum."

THE COMPARATIVE VALUES OF HOMATROPIN AND ATROPIN AS MYDRIATICS.

BY FLORENCE MAYO, M. D., PHILA., PA.

Medical News, June 27, 1896.

The writer was led to make these comparative tests owing to the fact that the reliability of homatropin as a mydriatic (cycloplegic C. H. M.) is doubted by many ophthalmologists. She examined fifty-five patients. Homatropin was used first (1 to 40), six drops, at intervals of five minutes, one hour before the first tests were made. After having estimated the state of refraction under homatropin, atropin (gr. ss. to fl. dram) was instilled, one drop, three times a day, for two days; then the eyes were examined again. Her conclusions were: "The table shows that the atropin confirmed the measurement made under homatropin; that it failed to reveal any error of refraction which the homatropin had not already uncovered, and that, if homatropin be properly used, it is a reliable mydriatic." (Cycloplegic C. H. M.)

NOTE ON EUCAINE AS A LOCAL ANÆSTHETIC.

BY ROBERT BRUDENELL CARTER, F. R. C. S., ENG.

The Lancet, July 11, 1896.

The writer was led to experiment with eucaine, the new local anaesthetic, on account of the published reports that it possessed the properties of cocaine as a local anaesthetic, but was less toxic, and had no effect upon the pupil. The absence of effect upon the pupil seemed to him to be of practical importance, because a dilated pupil is an impediment to the performance of many operations upon the eye. He used a 5 per cent watery solution of eucaine hydrochloride for a cataract extraction. "Before my arrival the nurse had applied a drop of the solution within the lower lid every five minutes for six times, and I found the eye perfectly insensitve. The pupil was unaffected and acted readily to light. There was scarcely any bleeding from the cut iris; there was perfect quiescence of the muscles, and there was no pain. * * * There was no pain afterwards, and healing was uninterrupted. I have since successfully used a single application of the same solution as a preliminary to the removal of a foreign body embedded in the corner."

"In the original paper it is said that eucaine has been successfully used in dentistry and laryngology, and that solutions may be injected hypodermically without injury. My first experiments will certainly induce me to use it again, and for tenotomies as well as for iridectomy or extraction. It is said that the solution above mentioned may be sterilized by boiling, again and again, if necessary, without undergoing decomposition or suffering any deterioration of quality."

THE RACIAL AND GEOGRAPHIC DISTRIBUTION OF TRACHOMA IN THE UNITED STATES OF AMERICA.

BY SWAN M. BURNETT, M. D., PH.D., WASHINGTON, D. C.

Amer. Journal of Ophthalm., Sept., 1896.

The writer has collected statistics and opinions respecting the geographic distribution and the influence of race upon the development of trachoma in the United States, based upon the replies received to letters of inquiry to men of known experience and judgment, residing in various sections of the country. Dr. Burnett has summarized the results obtained from an examination of these replies, and the following paragraphs are extracts from his summary:

1. "All recognize the existence of a follicular conjunctivitis as distinct from true trachoma, though many acknowledge the difficulty of making a differential diagnosis in the earlier stages of the disease, and for this reason, no doubt, the percentage of trachoma, in general, is higher than it should be. * * * All who express an opinion recognize in trachoma a disease whose final termination is a destruction, to a greater or less extent, of the conjunctival tissue, with cicatricial contraction, leading to entropion."

2. "As to contagion, opinions differ, though many are inclined to question its virulency. Some state that they have no knowledge of the direct transference of the disease from one person to another, and that it is not usual for more than one member of the same family to be affected with the disease at the same time, and that, sometimes, only one eye is attacked. Others state, in a general way, that they believe the disease to be contagious, and two report a direct infection of an eye by the material expressed from a trachomatous conjunctiva by the forceps during the operation of 'squeezing.' These experiences, while seeming to favor the contagiousness of trachoma, are by no means conclusive; for, while the discharge from the conjunctiva of an eye suffering from trachoma may be, and in certain stages of the affection usually is, contagious to a degree, the diseased process, following the contagion, is not necessarily trachoma. The infecting material produces an inflammation of the conjunctiva, and this conjunctivitis may lead to the development of trachoma in an eye predisposed to it. Usually the disease remains a follicular or a simple conjunctivitis. The idea of the contagiousness of trachoma became firmly impressed upon the professional mind when all forms of chronic conjunctivitis were classified as trachoma, and, like all such accepted notions, is not easy to eradicate. To establish the essential contagiousness of trachoma, as such, it is necessary to discover and isolate its peculiar microbe and produce the disease in a sound conjunctiva. This has not been done in a manner satisfactory to a majority of investigators. Moreover, the fact that the disease is not always most rife or pernicious in the overcrowded habitations of cities, but occurs, with equal virulency, in sparsely populated country districts and mountain regions (Ayres, Ray), would indicate that pure contagion plays an unimportant role in the development and spread of the disease. The statement that the disease is particularly rife in schools and asylums is not by any means, universally true;

and when such is proved to be the case, we should not attach all the blame to contagion."

3. "The cosmopolitan population of the United States furnishes a fine field for studying the influence of race in the origin and propagation of trachoma. There is no white race represented, to any considerable extent, in the United States, which is not reported by some one as liable to a greater or lesser degree. The Jews, the Irish, the Italians, seem to be the most affected. * * * The only race among us which enjoys a practical immunity is the negro. * * *"

4. "It will be gathered, from a reading of these reports, that altitude has but little modifying influence upon the disease. In fact, some of the most virulent cases were seen among the inhabitants of the mountains of West Virginia. * * * Latitude seems to have but little influence also. It is no more common at Portland, Maine, or Portland, Oregon, than Savannah, Georgia, or New Orleans, La. * * * It would seem, then, that trachoma is not to be found most commonly, or in its most virulent forms, solely in the crowded precincts of cities, where contagion could have its fullest influence, nor always at low altitudes, nor, in an equal degree, among the poor and filthy of all races. In other words, environment plays a less powerful role than has hitherto been supposed. Undoubtedly an inflammation of the conjunctiva of any kind will facilitate an outbreak of trachoma in an eye predisposed to the disease, in the same way that an attack of pneumonia will easily lead to an outbreak of tuberculosis in one with a tendency to that disease; but, as we sift the evidence more and more carefully, we find that the idiosyncrasy of the individual is the important factor in the development of the disease. In those possessed of a predisposition to trachoma, however, improper living and bad hygienic surroundings are, without question, large and most active elements in causing an outbreak of the affection; and in our therapeutics this should have a more prominent influence than it has hitherto had with the common acceptance of the disease as a mere local affection, instead of, as we believe, the manifestation of a dyscrasia."

**OBSERVATIONS UPON EYE DISEASES AND BLINDNESS IN THE
COLORED RACE.**

BY J. MORRISON RAY, M. D., LOUISVILLE, KY.

N. Y. Medical Journal, July 18, 1896.

As a result of the analysis of 1,000 consecutive cases of eye disease, exclusive of errors of refraction, the writer comes to the following conclusions: "A consideration of the material I have here gathered for study, while not disclosing anything new to most of those familiar with the subject, certainly furnished evidence in support of the statement that the negro race will be found to suffer to a greater percentage from the graver forms of eye disease than the white, and that certainly, in this State (Kentucky), blindness is more prevalent than among the whites. Further, that a well-defined difference exists in the two races in their proclivity to certain forms of eye disease, the negro being particularly liable to the destructive forms of corneal disease, and to the varieties of iritis accompanied by condylomatous developments. On the other side, he presents a peculiar, indescribable immunity from that form of contagious conjunctivitis familiarly known as 'granulated lids,' and a lessened liability to cancerous growths in this locality. Eye diseases, as a class, follow a more disastrous course, and consequently a larger number of blind are found."

**TWO YEARS IN A SOUTHERN EYE CLINIC, WITH ESPECIAL REFERENCE
TO DISEASES OF THE EYE IN THE NEGRO—FOUR THOUSAND
ONE HUNDRED AND SIXTY CASES ARRANGED
IN STATISTICAL TABLES.**

BY HENRY DICKSON BRUNS, M. D., NEW ORLEANS, LA.

Am. Journal of Ophthalmology, July and Aug., 1896.

This elaborate paper consists, in great part, of tables. The following are the most important statements accompanying these statistical tables: "The total number (766) of cases of error of refraction and affections of the extrinsic muscles, forms but 18.4 per cent of the whole 4160 cases recorded in these tables, while 81.6 per cent were cases of diseases of the eye.

* * The normal percentages (27.04) seems to be maintained in diseases and injuries of the lids and lachrymal apparatus (27+~~4~~); of the conjunctiva (28+~~4~~); of the cornea and sclera (29+~~4~~); of the lens (27+~~4~~) and of the optic nerve and retina (24+~~4~~). * * * The normal rate is very markedly exceeded in glaucoma (37+~~4~~); in diseases and injuries of the whole globe (37+~~4~~), and in diseases and in-

juries of the iris and ciliary body (55+%). * * * Chalazion is almost the only lid disease to which the negro is subject. Of the 127 negro cases in the table of lid and lachrymal diseases, 68 are cases of chalazion 53+%, while the malady forms but 21+% of all the white cases. * * * The black negro rarely has blepharitis, the mulatto not infrequently, this malady forming but 11+% of the diseases of the lid in the negro, against 30+% in the white. Catarrhal conjunctivitis forms 32+% of conjunctival diseases in the whites, and only 18+% in the negro; phlyctenular ophthalmia forms 40+% of all negro and only 17% of all white cases; pterygium forms 8% of all negro and only 5+% of all white cases. The rarity of trachoma among negroes is confirmed by this table; only 2% of trachomatous patients were found. I do not remember a case in a really dark negro; all were mulattoes."

THE VARIOUS MANIFESTATIONS OF EYE-STRAIN UPON THE EYE ITSELF, AND THE BEARING THIS HAS UPON TREATMENT.

BY ERNEST CLARKE, M. D., F. R. C. S., LONDON.

The Medical Press and Circular, May 27, 1896.

Dr. Clarke calls attention to a paper which he read two years ago (Ophth. Review, Nov. '94), in which he showed that blepharitis was invariably associated with an error of refraction, and that 65 per cent of the cases were astigmatic, and that if the eye-strain were not removed there would be a recurrence of the blepharitis after a temporary cure.

In the same way, the writer contends that conjunctivitis, keratitis, scleritis, iritis, glaucoma and cataract, may be, to a certain extent, dependent upon eye-strain.

Of conjunctivitis, he says, that only in the phlyctenular variety does he suggest any marked association with ametropia; but other forms will be found more amenable to local and general treatment if any existing error of refraction be corrected.

In phlyctenular keratitis, especially when there are relapses, he believes we will usually find some error of refraction, and most frequently, some astigmatism to be a predisposing cause. The use of glasses will prevent relapses in such case. This is the reason, he argues, why atropine is such a useful agent in these cases; it puts the eye at rest and allows it to get well:

In a large percentage of his cases of scleritis, he has found marked errors of refraction. "After correcting these with glasses, the various remedies have acted like a charm. Some cases that have resisted treatment for months, have been cured in a week or ten days."

"During the last three years I have attempted to determine the refraction of any iritis, and where I succeeded I have found, in every case, a serious error, and I believe the first, if not the best treatment, for recurrent iritis, is the correction of refractive errors. In this way I have, in many instances, prevented a relapse in patients who were constantly suffering."

"I have several patients under my care who have had one slight attack of primary glaucoma, and who, by wearing correcting lenses, have succeeded in warding off another attack. This may be a coincidence, but, if it is, it appears to me to be a very remarkable one. I do not suggest, for a moment, that every case of glaucoma is due to eye-strain, but from what we know of eye-strain, it is highly probable that, given other conditions, it may start an attack and thus form an important factor in the causation of this dire disease." Concerning cataract, he says: "Although for some time past I have fully recognized the important part that astigmatism plays in the causation of cataract, I confess I was much surprised at the result of the investigation I made for this paper. I have taken 200 cases of cataract eyes from my private case-books, beginning with my last cataract patient and ceasing when I reached the two hundredth. In a large number of these cases the cataract was incipient, and often only discovered when the pupil was dilated, and consequently the patient had no idea of the presence of the disease. I have only considered such cases as cataract when the lens showed opaque striae or patches in its substance, and I have excluded all cases of opacities on the capsule, the result of inflammation. In almost all the cases the examination was made and the refraction worked out under homatropine. Those cases in which the density of the cataract prevented the estimation of the refraction were excluded. Counting an error of refraction to be any astigmatism over 0. 25 D., and hypermetropia over 1. D., and any myopia, I found ametropia present in every case, and astigmatism present in 150, i. e., 75 per cent."

Continuing, the writer refers to Dodd's examinations, which showed that 18 per cent of all eyes present astigmatism. Contrasting this 18 per cent with the 75 per cent. which he had found in his cataractous patients, he claims that a distinct association between astigmatism and cataract is indicated. The manner in which astigmatism may lead to cataract he explains as follows:

"With few exceptions, the seat of regular astigmatism is in the cornea, due to a difference in the curvature of the different

meridians; added to this, there is sometimes found a 'static crystalline astigmatism,' due to a difference in the curvature of the different meridians of the lens, and the two together make up the total astigmatism of the eye which is revealed under an ordinary examination. But most frequently, although astigmatism of the eye is suspected, where it is of low degree it may be impossible to detect it without resorting to a mydriatic. Donders, in 1864, first drew attention to this, and he pointed out that the corneal astigmatism was masked and corrected by an inverse astigmatism of the lens. Dobrowalsky, in 1868, asserted that this crystalline astigmatism was produced by an unequal contraction of the ciliary muscle; and Hensen and Voelckers later have shown, by experiments upon animals, that this unequal contraction is possible. * * * But quite apart from the physiological proof, the clinical proofs are, to my mind, so conclusive that, in spite of the fact that many ophthalmologists decline to accept this theory, I, myself, thoroughly believe in it."

As a basis for subsequent discussion the writer takes a typical case, in which a patient complains of headache accentuated by near work, in which examination reveals no error of refraction. After the ciliary muscle has been paralyzed by the use of a mydriatic, astigmatism is discovered and corrected; very often when the effect of the mydriatic has passed off, the patient refuses the cylinder that improved his vision under atropine. In such a case, he explains, the "ciliary muscle returns to its old habit of unequal contraction, and, consequently, the correcting glasses, instead of helping, make matters worse; but by constantly wearing them the necessity for this unequal contraction disappears, the muscle resumes the normal condition and allows the glasses to do the work. Vision is then apparently worse without the glasses, because the muscle has forgotten its bad habit.

"What is more likely to interfere with the nutrition of the lens than this unequal contraction of the ciliary muscle, producing an artificial lenticular astigmatism, and constantly taking place. It is interesting to note that in the cases I examined, where the strain was more in one eye than the other, that eye showed greater changes, and in some cases was the only one affected by cataract."

"The practical deduction from all this is that by correcting the error of refraction and so removing the strain, we ought to be able to arrest or retard the development of cataract, and I fully believe that this is the case. The patients I have under

treatment at present most certainly illustrate this, but as the longest period of observation is only four years, the time is at present too short to enable me to use them as convincing proofs of the above theory; time alone will show this, and I shall hope at some future period to bring the subject again before you."

THE ARGYLL-ROBERTSON PUPIL, ITS NATURE AND SIGNIFICANCE; A CLINICAL STUDY.

BY T. K. MONRO, M. A., M. D., F. F. P. S. G., OF GLASGOW.

American Journal Medical Sciences, July, 1896.

In a lengthy, comprehensive and able article, the writer attempts to explain the nature and significance of the Argyll-Robertson pupil. He gives a short account of a case of his own, which was characterized by the exceedingly rare converse of the Argyll-Robertson pupil, i. e., contraction of the pupils in response to light, but not during accommodation. This paper is, of course, based upon speculation, since, as he remarks, morbid anatomy has not yet demonstrated the anatomical basis of this symptom. He concludes with the following summary: "An endeavor has been made to show that loss of the light-reflex (reflex iridoplegia) and loss of the skin-reflex (cutaneous iridoplegia) are, probably, both due to degeneration in the nucleus of the third nerve; and that it is unnecessary and undesirable to suppose a lesion of the afferent fibres running from the optic nerve to the oculomotor nucleus, on the one hand, and of motor fibres in the cervical cord, or of a cilio-spinal center in the cord or medulla, on the other. Reasons have been adduced for believing that the analogy between the loss of the knee-jerk and the loss of the light-reflex, ought not to be pressed so far as has been done by some authors; and for believing that the Argyll-Robertson symptom ought to be grouped with the other varieties of ophthalmoplegia." He says: "And as locomotor ataxy is, in the great majority of cases, a sequel of syphilis, it appears to me that the common factor in tabes (with its symptom, the lost knee-jerk) and in reflex iridoplegia may be, not a lesion of the sensory nervous system, but a preceding attack of syphilis."

ON THE VALUE OF THE OPHTHALMOSCOPE AS AN AID TO THE DIAGNOSIS OF CEREBRAL DISEASE IN PURULENT AFFECTIONS OF THE MIDDLE EAR.

BY THOMAS R. POLEY, M. D., NEW YORK.

Medical Record, Aug. 15, 1896.

An abstract of this paper appeared in the July, '96, number of the *Annals* (p. 778), in the Report of the Proceedings of the 1896 Meeting of the American Laryngological, Rhinological and Otological Society.

THE OPTICIANS AS OPHTHALMOLOGISTS.

Editorial in Medical News, Sept. 19, 1896.

"An effort was made, during the last session of the New York Legislature, to pass a bill entitled "An Act to Incorporate the Optical Society of the State of New York, etc." This objectionable measure was discussed at the time in the columns of the *News*, and the efforts of its promotors were defeated. But as it bids fair again to engage the attention of the Legislature during the coming winter, it seems appropriate to consider the merits of the case, as set forth in a recent issue of the *Optical Journal*. The writer says: "It is now pretty generally conceded among oculists, opticians, and the public, that the time has arrived when the practice of adapting glasses to the sight should be regulated by law."

This is an admission we are pleased to note, but the question naturally arises, is there any reason for more laws on the subject? Those already existing seem to cover the ground sufficiently, and define plainly enough who shall practice medicine in the State.

By their provisions some people, not physicians, are exempt from the application of the medical act, namely, manufacturers of artificial eyes, limbs and orthopedic instruments or trusses, and in fitting such instruments on persons in need thereof. But it does not exempt any class of men who fit eye-glasses. and, as the fitting of eye-glasses for the relief of headache, neuralgia, or any reflex due to defective vision, is practicing medicine, quite as much as the giving of remedies of any kind for the relief of any of the ailments to which the flesh is heir, it seems as if the adapting of glasses to the sight were sufficiently regulated by law at the present time.

Admitting the truth of this argument, it follows then, that the remaining portion of the article above quoted loses whatever force it would otherwise have. For instance, it goes on

to say, "At the present time, physicians and opticians alike are lawfully engaged in the practice of optometry. * * * Therefore, any legislation which would interfere with such vested rights would not only be cruel and unjust, but also unconstitutional."

If the opticians have been *lawfully* practicing optometry, as the gentleman puts it, what is the use of complaining at all; why do they not go on quietly practicing it and say nothing about it? The truth of the matter is, that the practice of optometry by the optician is an invasion of the prerogatives of the medical practitioner, and is, therefore, not lawful.

The fitting of glasses in hypermetropia, myopia, and astigmatism, the discrimination between amblyopia without optical lesion and that due to disease, the determination whether muscular defects are due to refractive errors or to grave spinal lesions, all these and many more tell us plainly that the fitting of glasses to the eyes should be in the hands of the physician alone, whose medical education and training make him competent to deal with these questions, which, even to his mind, are sometimes difficult, if not impossible, to solve.

The adjusting of spectacle frames, the proper centering of lenses, and many of the details of the optician's calling, necessitate experience and knowledge as much as the compounding of prescriptions for drugs. If the opticians would confine their efforts to perfecting their ranks in this particular, we feel confident that the co-operation of the medical profession would be theirs.

It is a simple matter to talk of the "vested rights" of the opticians, but they have no rights that are greater than the vested rights of citizens generally, and efforts to obtain "rights" that would be detrimental to the public weal ought never to meet with success, nor will they in this particular if the profession will assert its right, insisting as a necessary requirement of all who desire to become practitioners in any sense, that they comply with the laws governing medical practice."

ABSTRACTS FROM RECENT FRENCH AND ITALIAN OPHTHALMIC LITERATURE.

BY CASEY A. WOOD, M. D.

The Action of Mydrol (Phenylpyrazol Iodomethylate) on the Ocular Structures.—A Needle-Lance for the Decision of Secondary Cataract.—Prophylactic Enucleation before Operating on the Other Eye.—The Employment of Cocaine in Ophthalmic Surgery.—Subconjunctival Injections of Sodie Chloride in Detachment of the Retina.—Two Cases of Suppurative Iridochoroiditis from Autoinfection.

THE ACTION OF MYDROL (PHENYL-PYRAZOL IODOMETHYLATE) ON THE OCULAR STRUCTURES.

One of the best papers that has recently appeared in Italian periodicals bears the above title.* The drug was first obtained synthetically from pyrazol, and is found as a white, amorphous, viscous body, bitter, odorless, and soluble in water and alcohol, but insoluble in ether. Sabbatani, who was the first to study the physiological action of the drug, found that it acts as a mydriatic on animal eyes with round pupils, and is a constrictor of their conjunctival vessels, but in the cat and other animals with oblong pupils, it had no such action. When, however, the trunk of the sympathetic in the neck is cut, mydrol does not influence the size of the pupil to any marked extent.

Where one or two drops of a 10% solution are instilled into the human eye, there is no irritation set up, a very slight and transient myosis is at first observed, while the conjunctive becomes paler and less sensitive to the touch, and the subject notices a cool sensation about the eye. In about fifteen minutes the pupil begins to dilate and reaches its maximum size in from $\frac{1}{2}$ to $1\frac{1}{4}$ hours. This complete mydriasis is maintained from $1\frac{1}{2}$ to $2\frac{1}{2}$ hours, and in from 2 to 8 hours it again assumes its normal dimensions. After 24 hours no difference between the two pupils can be perceived.

* Alfonso Cattaneo. Azione sull' occhio del iodometilato di fenilpirazolo (Mydrol). *Annali di Ottalmologia*, Anno XXV, Fasc 4, 1896, p. 361.

The author found that when in dogs the trunk of the sympathetic had been cut, mydrol produced only a slight pupillary dilatation which lasted but a short time. He consequently assigns, as a cause of the mydriasis, an irritation of the sympathetic fibres in the iris.

Mydrol has but a slight effect upon the accommodation. When frequently instilled in strong doses (20%) it brings about a slight accommodative paresis which lasts but a short time.

Another evidence of its action on the sympathetic is a peculiar effect on the eye, viz.: a slight protrusion of the globe and a marked increase of the interpapillary space.

Cattaneo found also that mydrol exercises an effect upon the terminal branches of the third nerve, very similar to that produced by eserine, and shows, by elaborate experiments, that, as Tweedy proved in the case of gelsemin, that the power of all the extrinsic ocular muscles is lessened by the instillation of mydrol.

Strong solutions of mydrol (5 to 25%) appear to increase the intra-ocular tension, but this is not the case when weaker solutions are employed.

The action of the iodomethylate upon an eye already under the influence of a myotic was also noted. It does not overcome the myosis produced by a half per cent. solution of eserine, but it does cut short its duration. On the other hand, repeated instillations of mydrol expand the pupil treated with a drop of a one-third per cent. solution.

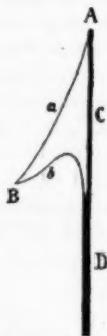
The employment of mydrol in ophthalmic surgery will probably be limited to its use as a simple mydriatic. It is well adapted to ophthalmoscopic examinations because of the short duration of the pupillary dilatation, because it does not affect the accommodation and since it does not increase the ocular tension. As a cycloplegic and remedial agent, it is quite inferior to atropine, homatropine and duboisine.

A NEEDLE-LANCE FOR THE DISSECTION OF SECONDARY CATARACT.

Doctor George Weill describes* an instrument used for 18 months in Prof. Stilling's clinic at Strasburg, in operations for secondary cataract. This is in the form of a half-arrow head (see figure). It may be regarded as a modification of Noyes' hook, except that, while the latter can be introduced into the anterior chamber only after a preliminary corneal incision, the lancet-needle, in consequence of its size and pe-

* *Alguilles-lancettes pour les opérations de cataracte secondaire. Revue générale d'ophtalmologie*, August, 1896, p. 337.

cular construction, may be employed without the use of another instrument. The lance has two cutting edges, *a* and *b*, *a* intended to cut through the cornea, so that the whole blade may enter the anterior chamber, and *b* for the laceration of the cataract. The instrument should be held with its blade horizontal, and introduced into the anterior chamber. This being accomplished, it is turned about 90° so that the point *b* penetrates the cataract, and is moved about in various direc-



tions until the membrane is sufficiently lacerated. The instrument is now carefully removed through the opening and, says Weill, if the manoeuvre be carefully executed there will be little or no loss of aqueous. The writer also especially recommends its employment in the decision of congenital—cataract—particularly when the anterior capsule is thickened or where the ordinary needle operation has failed.

PROPHYLACTIC ENUCLEATION BEFORE OPERATING ON THE OTHER EYE.

With a frankness that does him credit, Pechdo,* of Villafra, relates his unfortunate experience in two cases of cataract extraction where, owing to neglect of the precaution about which he writes, the otherwise healthy eyes were lost.

In the first instance, the right eye had been operated upon by a confrere, and had been lost, as the result of an occluded pupil (displaced upwards), and an incarceration of the iris. The operation (combined) on the left eye was not followed by any accident until the eleventh day when, without apparent reason, the patient began to complain. An iritis now declared itself, lachrymation set in, the eye became red and very pain-

* De l'enucleation préventive avant opération sur l'œil sain. *Recueil d'ophtalmologie*, Sept., 1896, p. 533.

ful, posterior synechiae formed, and, finally, in spite of all treatment, the eye was destroyed without a trace of suppuration. When it was too late, the writer discovered that the right eye had long been sensitive to pressure.

Several months afterwards he operated upon the left eye of an old man who, twenty years before, had lost the right from an accident. This eye had already greatly atrophied. The operation on the left eye passed off well; the patient made a good recovery and left Villafranca on the fourteenth day—a little early, perhaps, as the eye was still sensitive. Six days afterwards he returned complaining of photophobia and lachrymation in the eye operated upon. It was also tender, painful, and presented a displaced pupil. The patient had been careful of himself, and there were no evidences of suppuration. This time Pechdo did not hesitate to remove the stump on the right side, which was even then sensitive to pressure. In the centre of the globe he found a small piece of oxidized iron. The excision did not stay the march of the sympathetic disease; in spite of all remedial applications, the pupil closed, and the patient was left entirely blind.

The writer advises that, where the surgeon proposes to do an operation upon the eye which necessitates piercing the globe (and particularly in cataract extraction), he should not hesitate to remove the other eye as a precautionary measure if the latter be a blind eye, lost from any penetrating wound. Dormant germs lodged within the lost eye or well on their way towards the sound organ, may be roused into activity by the processes involved in the attempted repair of a corneal or scleral incision.

THE EMPLOYMENT OF COCAIN IN OPHTHALMIC SURGERY.

Germaix remarks* that for five years he has almost suppressed the use of chloroform in his clinic. During this period he has used it twice only—in the case of children. He uses a 5% solution of cocain very freely until he obtains complete anesthesia of the globe and lid structures. He uses it in all cases of surgery of the lids—the various forms of grafting, in operations for trichiasis and entropion—and in enucleations. For these purposes, however, he prefers chloroform in the case of young children, say of 6 or 7 years of age.

In prolonged operations he has used large quantities of a 5% solution, as much as 40 centigrams (or 800 drops) instilled

* Note sur l'emploi de la cocaïne dans la chirurgie oculaire. *Recueil d'ophtalmologie*, Sept., 1896, p. 335.

into the conjunctival sac. In subcutaneous medication, during lid operations, he has injected as much as 5 centigrams in young subjects; in adults as high as 20 centigrams. He does not think that this plan is a dangerous one, having adopted it for nursing mothers and for women far advanced in pregnancy, without the least inconvenience. In the former case, he advises the mother to refrain from nursing her child until 12 hours after the operation. Of 125 operations, chiefly on the lid, done by him upon native Algerians in one week, he gave chloroform in two instances only. The first case, a boy, nearly died; in the second, an old man, aged 67, he was obliged to stop the general anesthetic and complete the operation (enucleation) by the aid of subconjunctival and postorbital injections of cocain. Both patients had organic disease of the heart.

SUBCONJUNCTIVAL INJECTIONS OF SODIC CHLORIDE IN DETACHMENT OF THE RETINA.

Lodato, of Palermo, concludes, after a study* of this method of treatment (in doses of 1 cubic centimeter of a 2% solution), that in recent cases it brings about an improvement more or less marked. In some instances, the detached retina is entirely replaced. With this reattachment goes a corresponding increase in vision and in the limits of the visual field. The improvement, he finds, is rapid and begins to show itself after the first injection, while it is less marked after a second or a third treatment. If the first three injections do not improve matters it is useless to continue them, since experience shows that subsequent medication does not influence the detachment. They are efficacious without special reference to the cause of the lesion, and act equally well both in myopic and traumatic cases. Turbidity of the vitreous, however, is a contra-indication for their employment. They are almost painless, and give rise to no serious consequences. The report is accompanied by numerous cuts of perimeter charts.

TWO CASES OF SUPPURATIVE IRIDO-CHOROIDITIS FROM AUTO-INFECTION.

Instances of suppurative irido-choroiditis of puerperal origin are common enough, Rancurel, in his inaugural thesis having made a list of 32 cases, but examples of this serious eye dis-

* Le iniezioni sottoconjuntivali di clorure di sodio nel distacco di retina. *Archivio di Ottalmologia*, July-August, 1896, p. 47.

ease, following a general infection, are comparatively rare. Most of them are reported as having resulted from suppurative arthritis.

*Despaquet reports two cases. The first patient had a joint affection, but it was a secondary—not a primary—lesion. His history is as follows: X, man, 28 years of age, was seized, at the end of January, 1890, by a broncho-pneumonia following la grippe. After three weeks of severe illness, he began to be convalescent, but was very thin and had a constant cough. Eight days subsequently he resumed his work when, one Sunday evening, it was noticed that his left eye was red and inflamed. He did not suffer in the least, but there was considerable lachrymation. Later, the inflammatory symptoms increased in violence. The next day the vision became cloudy and the lids oedematous, but, strange to say, there was no pain. On the following day vision was completely lost. He then consulted Despaquet, who found the lids red and swollen, a serous effusion about the cornea (which, however, was transparent), normal anterior chamber, the iris darker colored than its fellow, and the pupil slightly dilated and irregular in shape. A bluish white reflex showed from the depths of the eye. Fundus not visible. No tenderness on pressure. Treatment: subconjunctival injections of sublimate, and mercurial inunction. On the next day there was a commencing hypopion, and this increased in volume until the whole of the iris was covered with pus. Still there was no pain and on this account the patient refused a proposed enucleation. About this time the left capsulo-humeral joint became red, inflamed and painful, both to pressure and on movement. Eventually the eye was removed, and on section showed, in place of the vitreous, a compact mass of exudation attached to surrounding parts and to the iris. The cornea was softened and infiltrated. A bacteriological examination showed the presence of the streptococcus, and of several staphylococci, but no pneumococci. The patient has since recovered good health.

The writer believes the primary seat of the infection to have been in the lungs and that microbes had been carried thence to the eye and shoulder joint.

The second case is an interesting one of puerperal infection. The patient, October 28, had been delivered of her second

* Deux cas d'irido-choroïdite suppurative par auto-infection. *Revue d'ophtalmologie*, Sept., 1896, p. 523.

child. During the last month of her confinement the vagina had been daily washed out with a sublimate solution and during the accouchment, which was entirely normal, the most minute antiseptic precautions were taken. On the fifth day she had a chill, and this was followed by a right sided phlegmasia dolens, which kept her in bed six weeks. Suddenly a violent but painless ocular inflammation set in and pus showed itself in the anterior chamber. Despaquet was now called, and found the lids red and slightly oedematous; intense pericorneal injection; cornea healthy; the anterior chamber two-thirds full of pus. Through the upper third of the pupil the fundus could be faintly seen, and the lower part of the retina was sensitive to light. There was no tenderness on pressure. Treatment: leeches, subconjunctival injections of sublimate, and hypodermic injections of mercuric cyanide. The disease both in the leg and eye slowly disappeared. In the lower part of the fundus there remained a large, motionless, non-vascular, blue-white mass. The papilla and the upper part of the fundus are readily seen with the mirror. Vision-fingers at a meter.

The recovery of both patients, in spite of the embolic suppurative irido-choroiditis and the visual result in the second case are worthy of notice. The writer attributes the satisfactory termination in the second instance, and especially the avoidance of enucleation, to the vigorous treatment.

ABSTRACTS FROM GERMAN OPHTHALMIC LITERATURE.

Quarter ending Oct. 1, 1896.

By H. V. WURDEMAN, M. D.,
OF MILWAUKEE, WIS.

Partial Ciliary Muscle Contraction and Correcting Lenticular Astigmatism.—Foreign Body Giant Cells in the Eye.—Micropia and Macropia.—Forms of Retinitis Pigmentosa.—Retinitis Circinata.—Retina and Infectious Diseases.—Epidemic Hemeralopia.—Tubercle of Lachrymal Glands.—Resorption of Blood in the Eye.—Irrigation Method of Kalt in Purulent Ophthalmia.—Primary Oculo-Motor Paralysis in Typhus.—Effects of Electric Light Upon Ocular Tissues.—Fixation of the Paralyzed Eye.—Improvement of Vision Through Tattooing of the Cornea.—Mollusum Contagiosum of the Eyelids.—Eucain Again.—Operation for Ptosis.—Magnet Operations.—Conjunctival Diphtheria Treated with Serum.—Eucain in Ocular Practice.—Cancer Serum and Formal in Inoperable Ocular Tumors.—Changes in the Lens During Accommodation.—Zonular Tension and Shape of the Lens.—Degeneration of the Retina Through Particles of Iron.—Retinitis Proliferans.—Hutchinson's Changes in the Fundus.—Seldom Observed Retinal Disease.—Atrophy of Macular Fibers in Diabetes.—Hyalitis and Uveitis.—Anatomical Basis of Pseudo-Glioma and Pseudo Tumors.—Carcinoma Spongiosum.—Elastic Fibers of Sclera.—Operations Upon Tear Sac and Ectropion.—Operation for Scleral Ectasia.—Etiology of Conjunctival Inflammations.—Pathology of Trachoma.—Fungus Growths Upon the Conjunctiva.—Cyst of Conjunctiva and Upper Eyelid.—Acute Epidemic Conjunctivitis.—Cocain in Glaucomic Conditions.—Keratitis Parenchymatosa.—Eye Disease and Gout.—Importance of Local Therapeutic Measures in Infectious or Sympathetic Irido-choroiditis.—Transplantation of Conjunctival Flaps.—Recovery of Function after Embolism.—Record of High Grades of Ametropia.—Mild Metastatic Inflammation of the Eye.—Congenital Microphthalmus.—Congenital Periodic Exophthalmus.—Filaria of Retina.—Filaria Loa Guyot.—Blindness with Bilateral Brain Disease.—Subconjunctival Injections.—Tuberculosis of the Conjunctiva.—Treatment of Hypopion Keratitis at Basel.—Shall Granulations Be Treated Lightly or Heroically?—The Etiology and Treatment of Glaucoma.—Nosphen in Ophthalmic Practice.—Epithelioma of Eyelids and Face.—Glaucoma After Cataract.—Operations.—Tolerance of the Orbit to Foreign Bodies.—Multiple Laceration of Iris Between Pupil and Ciliary Region.—An Experiment with Foreign Body in the Anterior Chamber.—A Simple Detection of One Kind of Simulation.—A New Form of Keratoscope.—The Use of Aethylenediamin Silver Phosphate (the So-Called Argentamin) in Ophthalmic Practice.—Carcinoma of Conjunctiva Originating from a Scar After Exenteration.—Acromegaly with Temporal Hemianopsia.—A Typical Spring Catarrh Simulating Corneal Tumor.—Lenticulus Posterior.

UPON THE OCCURRENCE OF PARTIAL CILIARY MUSCLE CONTRACTION AND CORRECTING LENTICULAR ASTIGMATISM.

Hess, Carl (Archiv. f. Ophth., XLII, 2, 1896). Giraud-Teulon and Dobrowsky were the first to bring up the hy-

pothesis of partial correction of corneal astigmatism by a secondary ciliary muscle contraction acting upon the lens. This was believed to occur only in eyes which require the highest degree of visual acuity, the correction being usually in the vertical meridian. Hess makes a critical study of the works of other authors, a number of which conclude that corrective lenticular astigmatism through partial ciliary muscle contraction, may reach to 1 D. He states that most observers have concluded that the corneal astigmatism was always the same, which he disproves by personal experiments upon his own emmetropic eyes. He finds that the visual acuity is much less with cylinder glasses when the eyes are widely open than when the orbital fissure is made smaller, or when stenopaeic disk is used. There is the same element of uncertainty in other objective tests. He points out the errors in Ehrens and in Mitchell's previous statistics. In order to show the kind of vision that astigmatic eyes possess, he has photographed a number of disks, test cards and letters through different cylindrical lenses, which are reproduced in the article. Going over the literature on the subject, he concludes that there is no partial contraction of the ciliary muscle, and that the hitherto reported cases have been improperly observed and reported. In the second chapter of this article upon the sight of the astigmatic, he shows, in connection with the illustrations, several kinds of vision with and without glasses, particularly in connection with the Snellen's cross, and with a test object composed of a clear glass plate upon which an eight-arm cross is made, the bars each of four fine silver wires. He reports a series of eight cases showing the vision with and without glasses. In the third chapter he goes into experimental measurements upon the question of the existence of partial ciliary muscle contraction, using a special apparatus for the same, arriving at the following conclusions: The existence of partial ciliary contraction has not been proven, despite previous observations by different writers, all which may be shown to have been attended by many errors. The reading tests are not proper ones to depend upon. Neglect of observation of the state of the pupil and the changes in the palpebral fissure have led to failures. In experiments upon astigmatics and emmetropes made astigmatic, which, in 23 cases, represented all kinds of refractive errors, the existence of any amount of partial ciliary contraction was not proven, and although efforts

were made to excite irregular ciliary contraction, this could not be done, and its existence is thus problematical.

Literature on the subject is extensively quoted.

H. V. W.

OBSERVATIONS UPON FOREIGN BODY GIANT CELLS IN THE EYE.

Wagenmann, A., (*Archiv. f. Ophtha.* XLII, 2, 1896), states that giant cells without bacillary tuberculosis, arise from a number of diseases, as well as all kinds of foreign bodies. It has been a disputed point whether tubercular disease was not the cause of these cells, and yet for many years has it been noticed that foreign bodies, such as hairs carried under the conjunctiva, or into the eye from an external wound, may give rise to a pseudo-tubercular formation in the conjunctiva or iris. It has also been noticed that giant cells occur in chalazia. They arise from aseptic foreign bodies of varied nature, copper, lead, gold dust, etc. These cells are absorbed. Sometimes they occur in other parts of the body as well as the eye, mixed with cholesterin, and these may seem like tubercular deposits. Instances have been recorded in the ovaries, ear, etc.

It is considered that these are developed from the endothelium. Such have been found in old emboli of the arteria centralis retinae, in atheroma, in polypi, and in pseudo-glionfa, especially combined with cholesterin masses. A case is cited of a girl 15½ years of age whose left eye had been diseased since childhood, with symptoms of a tumor in the eye, and increased tension, for which the eye was enucleated. A careful study of the microscopic conditions in the individual structures is given, in which proliferation of tissue has resulted in giant cells containing red blood corpuscles and chalk formation which had become foreign body giant cells. In another case, it followed spontaneous ablatio retinae after iridocyclitis. In another injury, thirteen years before, was found the same formation. Other cases of foreign bodies in the cornea, iris, lens, with and without retention of the body in the ball, lacerations of the ball, luxated cataract and chronic irido-choroiditis and injuries from percussion caps, are shown. A case is cited where the giant cells have been developed in the neighborhood of the lens capsule; another where the new cells were caused by the existence of cysticercus. Illustrated by 15 plates.

H. V. W.

A STUDY OF MICROPIA AND MACROPIA.

Koster (*Archiv. f. Ophth.*, XLII, 3, 1896). In 1886 Donders reconsidered his previous explanation of micropia occur-

ring during accommodation-paralysis, and agreed with Javal, that the phenomenon must be due to diminution of the retinal picture following a more posterior position of the lens. Redingus and Snellen later have controverted this, and believe that micropia, occurring after paresis of accommodation by mydriatics, is due to false visual projection, and is a true subjective symptom. Koster has experimented with the "haploscope" of Hering (a form of stereoscope), in the production of micropia and macropia, by changing the visual lines, by asymmetrical convergence and accommodation in maximal accommodation, in paralysis of accommodation, by ordinary convergence and change of the accommodation with stereoscopy, by fatigue of convergence with stereoscopy, in anisometropia, etc. From these studies he concludes that the symptoms are purely subjective and due to interference of the relation of accommodation to the convergence.

H. V. W.

UPON TWO INTERCHANGEABLE FORMS OF RETINITIS PIGMENTOSA.

Fuchs, E. (Archiv. f. Augenheilkde, XXXII, 2, 1896). (Retinitis punctata albescens et Atrophia gyrata choroida et retinae.) Atrophy of the retina and choroid have causes in common; the two forms described arise from the hereditary pre-disposition and begin in childhood or youth, having a lengthy but progressive course, the first symptom being hemeralopia. Fuchs describes under the name of atrophgia gyrata, a form of retinal and choroidal atrophy, which is pictorially well represented.

H. V. W.

A CASE OF RETINITIS CIRCINATA.

Weltert, J. (Archiv. f. Augenheilkde., XXII, 3, 1896). This case is especially interesting on account of it happening in a twelve-year-old girl whose vision and changes in the fundus were well studied and were cured through radical treatment (mercurial inunction). The connection of the choroidal with the retinal disease was especially noticeable in the beginning. This disease, as a rule, is met with in old syphilitics, and is generally supposed to be incurable.

H. V. W.

CHANGES IN THE RETINA DUE TO INFECTIOUS DISEASE.

Dolganoff (Archiv. f. Augenhkde., XXXII, 3, 1896). On account of pathologic-anatomic experiments, the connection of diseases of the eyes and the infection of syphilis, tuberculosis

and septicemia, is well understood. In the other infectious diseases, a positive conclusion has not been reached. The author made repeated subcutaneous injections in dogs and rabbits, of the staph. pyog. aur., in order to cause amyloid degeneration. The result was as follows: The optic nerve became filled with white blood corpuscles, and its connective tissue increased; the vessels of the retina were changed by the formation of vacuoles in the endothelium cells and by little occlusions, the lumen being only partly stopped up; edema of all coats of the retina, albuminuric and edemic degeneration of the ganglion cells, exudate between the bundles of nerve fibres and homogeneous masses, which, under the reaction of Gieson, appeared to be of amyloid nature; destruction of the elements of the rods and cones through inflammatory exudate; albuminuric exudate between the choroid and retina and in the vitreous; thickening of all the vitreal fibres, the posterior part of the vitreous especially changed through imbibition of lymphoid elements.

A CONTRIBUTION TO THE KNOWLEDGE OF EPIDEMIC HEMERALOPIA.

Schtschepotjew, N. (*Archiv. f. Augenhkde.*, XXXII, 3, 1896). In counter-distinction to most observers of experience who have noted epidemics of hemeralopia, Schtschepotjew does not consider blinding and deficient assimilation the principal causes. The epidemic begins in the spring-time when the lighting is yet weak, and when the temperature of day and night is much the same. Spring happens to be the fasting time in Russia. There is more of the disease in the Northern than in the warm Southern provinces. It occurs in sound, well-nourished people in good circumstances, as well as in weak, undeveloped workers, but it happens in low lands and in wet places. He believes from the time and the place that it should be placed among the miasmatic diseases. Its principal symptom (the diminishment of the vision in dim light, and diminishment of the sense of vision for blue and green, less so for yellow, red and white), does not depend upon the quality of the light, but upon destruction of light and color sense. The hemeralope sees very much worse after the sun has gone down than in good day-light. We cannot tell in what portion of the visual apparatus the lesion is. Schtschepotjew considers that the change is of a vasomotor character for the reason that often there is enlargement of the veins and contraction of the arteries of the retina, and that hemeralopia

may occur from tape-worm, through sudden fright, as well as in quinin and antipyrin poisoning. Quinin and antipyrin and warm foot baths do not do any good to the ocular circulation. Schtschepotjew recommends cod liver oil and cooked liver in treatment.

H. V. W.

TUBERCLE OF LACHRYMAL GLAND.

Pick (Centralbl. f. Prak. Augenhkde., April, 1896), reports a case of symmetrical enlargement of the lachrymal glands occurring in a woman 58 years of age. The swellings were, from the first, very hard, sharply limited from the surrounding tissues, painless and not at all interfering with the movements of the eyes; they slowly increased in size. Both tumors were removed. Microscopic examination showed no trace of gland tissue, the appearances being in favor of a tuberculous inflammation, but not conclusively. No bacilli could be found, and inoculation gave negative results. There was a tuberculous family history.

Eight similar cases in all have been reported, in two of which there were tubercle bacilli.

H. V. W.

THE RESORPTION OF BLOOD IN THE EYE.

Linde, Max, (Centralbl. f. Prak. Augenhkde., July, 1896). Recently much has been written concerning the role played by the canal of Schlemm in the secretion and resorption of the aqueous humor. It is clear that it takes a prominent part in the resorption of blood from the anterior chamber; but when it is considered that this canal is a lymph channel, a problem arises. Linde experimented upon 24 rabbits' eyes by tearing the iris, thus producing bleeding into the anterior chamber, finding that absorption begins in the third day. Fibrinous masses are attached to Descemet's membrane, to the anterior capsule, lens and iris. On the ninth to the fourteenth day, in eyes that do not become inflamed, the blood has been apparently resorbed, but microscopic examination shows that there is yet blood in the anterior chamber. Section of the eyes reveals that the vitreous is colored with blood, which, under the microscope, is seen to be due to blood crystals without cellular elements. The lens is also colored and remains reddish for a long time, like a Morgagnian cataract. This redness extends in bands from the nucleus, and fibrinous blood deposits are found on the capsule. The retina and choroid are also infiltrated showing hemorrhages in places, especially be-

tween the pigment epithelium and the choroid. The ciliary body is swollen and hyperemic, wandering blood cells are found in the ciliary processes. The posterior chamber remains full of blood after that in the anterior chamber has been fully resorbed. The torn portion of the iris is thickened and infiltrated, the vessels enlarged and full of blood. Blood on the surface of the iris is usually the first to be resorbed. The angle of the anterior chamber is full of blood detritus, especially in the canal of Schlemm, in which locality the last traces remain. The blood vessels and veins parallel to the canal, are enlarged, turgid, and filled with blood. Often for days afterwards, the cornea looks reddish on account of the blood deposits on its posterior surface, in and on Descemet's membrane. Such is the course of bleeding in the normal eye. In an infected or otherwise injured globe, the resorption makes no progress. Examination reveals fresh bleeding next to newly made connective tissue deposits. The vessels and posterior chamber become so choked up that the eye goes on to glaucoma or iridocyclitis. Further observations will have to be made to definitely ascertain the role played by the space of Fontana and the canal of Schlemm in resorption.

H. V. W.

UPON THE IRRIGATION METHOD OF KALT IN TREATMENT OF PURULENT OPHTHALMIA.

Hoor, K. (Centralbl. f. Prak. Augenhkde., August, 1896), claims to have used a similar method of treatment in purulent ophthalmia for twelve years, and to have published his results eight and four years ago. He made large irrigations of weak permanganat of potash solution every quarter hour, the lids gently manipulated and touched lightly with cotton sponges dipped in the solution. He does not believe that cleansing every third or fourth hour is sufficient, and thinks that it is allowable even every fifteen minutes, as a quarter-hour after thorough cleansing, in blenorrheal ophthalmia, the conjunctival cul-de-sac is to be found filled with secretion. He objects to the irrigation tube of Kalt, or to any other hard instrument in the hands of the patient or nurse, on account of the danger of abraiding the cornea. Does not allow anything but absorbent cotton to be brought in the neighborhood of the eye. He has not found that blenorrhea in the adult, except in very light cases, may be cured by this method in from 12 to 15 days, as has been claimed by Kalt, or, that cases of gonorrheal conjunctivitis of adults, are always cured without

corneal lesion, the latter of which has been claimed by Dufour. He does not consider that Kalt's method is new, or that it is exceptionally good. H. V. W.

PRIMARY MOTOR PARALYSIS IN THE OCULO-MOTOR TRACT AND OTHER POST-TYPHOID COMPLICATIONS IN A CASE OF ABDOMINAL TYPHUS.

Ebstein, W. (*Archiv. f. Path. Anat., Physiol. und Klin. Med.*, Virchow, Band, 145, Heft, 1, July, 1896), reports such a rare case in a student of medicine, aged 20, attended by relapse and nervous symptoms, previously healthy except at three years of age, had diphtheria. Was taken ill, in a house in which recently there had been cases of typhoid fever, with cough and pain in the breast, discharge of brownish fluid for three days from both ears, ptosis and paralysis of the left rectus internus, characteristic typhoid temperature and pulse, and ptosis. Fever until nineteenth day, when normal for a few days, followed by severe relapse and high temperature. Convulsions and cramps six weeks after first attack on the left side; tonic, then clonic spasm of the N. fac. sin., then in right arm and both extremities. Biting of tongue, pupils dilated, and not reacting during the convulsions. Urine concentrated and scanty, no sugar, but little albumen, and many hyaline casts. On drinking a little milk, a bleb-like eruption appeared on the body. The patient remained unconscious and had involuntary bladder and bowel movements, clonic cramps of the eye muscles and convergent strabismus, hyperesthesia of the lower extremities. Recovery occurred about four months after the beginning of the illness. Ebstein believes that the symptoms were due to cerebral irritation or a light inflammation. The primary oculo-motor paralysis is considered to have been caused by a local peripheral neuritis. H. V. W.

REMARKS UPON THE EFFECTS OF THE ELECTRIC ARC LIGHT UPON THE OCULAR TISSUES.

Ogneff, J. (*Archiv. f. d. ges. Physiol.* LXIII, 5, 6, p. 209, 1896). Following Maklakoff, and the experiments of others. Ogneff placed frogs, pigeons and rabbits before an arc light of 250 to 500 volts, by which thick iron plates could be melted in a minute, during which the temperature of the room was raised from 2 to 8 degrees centigrade. The symptoms of inflammation began in about four hours. One animal died without showing any changes. Another revived after a short illness. The conjunctiva became swollen in most of the cases.

The epithelium of the cornea thickened and raised; in the case of the frogs, often perforated without clouding. Examination of the enucleated eyes showed the following: Short exposure to the electric arc light of considerable strength and peculiar richness in violet and ultra-violet rays, causes direct irritation to the nuclei of the epithelial cells and the fixed cells of the cornea. The karyomitosis begins immediately following the exposure. Further exposure causes necrosis of the cells, beginning in the outer layer. In the case of the fixed corneal cells, the necrosis begins as an amitotic increase in the neuclei. The different tissues and parts of the eye react differently to the light. The retina is the least affected, although other authors have here found decided changes. The lens and vitreous also remain intact. H. V. W.

UPON FIXATION OF THE PARALYZED EYE.

Kunn, Karl (Wien. Klin. Wochenschr. No. 26, June 25, 1896), at a meeting of the Wiener Medicinischer Club, June 10th, 1896, stated that mechanical, as well as optical principles, which may be disturbed in several ways, are involved in binocular fixation. This occurs when one eye undertakes fixation, the other squints, as in concomitant strabismus. In ordinary ocular paralysis, the eye with sound muscles fixes, while the other squints. This rule is sometimes reversed, as was first shown by Mauthner, for when the paralyzed eye has better vision, the other eye may secondarily deviate. An exception to this rule has not, hitherto, been observed. Mauthner considers this to be due to muscle spasm of the sound eye, for the reason that the sound eye remains in a secondary position greater than the primary deviation, but Kunn has observed six cases in which there was fixation of the paralyzed side, although the sight was not better. In two cases, even, it was weaker than that of the sound eye. The reporter could not give an explanation for this paradox, except that there were individual peculiarities which are unknown. The clinical picture, for instance, in a case where there was paralysis of the left external rectus, would be the following: The left eye squints inwards, but when the individual fixes with the left eye, it seeks a favorable position, as the head is then turned to the left, so that the objects are brought over to the paralyzed side. At the same time, an impulse is carried to the left external rectus, which can not be taken up, but as the right internal rectus is associated with this, this impulse is turned into convergence of the right eye, while the left fixes. The age

and the etiology of the paralysis seems to have nothing to do with this condition. He showed a case in which this phenomenon existed in a man 33 years of age, who had acquired syphilis in 1890. His eye disease came on in February of this year. When the eyes are quiet, he fixes with the left eye, the right being turned outwards. In the right eye there exists complete oculo-motor paralysis. Pupillary reaction and accommodation are normal. The eyes are emmetropic. In the sound left eye the sight is 6/V; in the paralyzed eye, 5/VI. When the left eye is covered, and the right is brought into fixation, the patient can hold it, and does not bring the left eye into the visual line.

H. V. W.

IMPROVEMENT OF VISION THROUGH TATOOING OF THE CORNEA.

Neuburger, Sig. (Münch. Med. Woch., LXIII, 16, 1896), describes a case in which tatooing of the corneal scar was done, not alone for cosmetic purposes, but to improve the visual acuity. In the case of a 52 year old workman who had a thin but large leucoma of the cornea in the neighborhood of the pupil following an injury, after tatooing, the vision was improved from 17/XVII, to 17/XX.

H. V. W.

A CASE OF MOLLUSCUM CONTAGIOSUM OF THE EYELIDS.

Salzer (Münch. Med. Wochenschr., Sept. 8, 1896), saw a case in a woman aged 33, who came with little white lumps upon the eyelids, which had been there for a couple of years, and which recently had become larger. These were extirpated and were found to be molluscum bodies. In the same house there was another woman who had for two years a tumor upon the cheek, the size of a pea, which, from time to time, broke and discharged a whitish fluid, and then dried up. Two years before, these patients had pet doves in the house, which often came into direct contact with them. These doves died during the winter with loss of feathers, and evidences of "Bollinger's Geflügel Pocken," which is the epithelioma-contagiosum of animals. The contagion is supposed to have been carried to the eye and the cheek from the fingers. Experimental inoculation was made upon a chicken and a pigeon, producing the same disease, but as these two animals were stolen for culinary purposes, a complete study was not made.

H. V. W.

EUCAIN AGAIN.

Vollert (Münch. Med. Wochenschr., Sept. 15, 1896), has secured a purer product from the Schering Fabrik, which is free from methyl-alcohol, and causes less irritation when

dropped in the eye. He does not agree with Berger and Da Vinci, in that a 2% lotion causes little irritation, and that there is no effect upon the corneal epithelium. He finds full anesthesia following three drops of the 5% solution, disappearing 20 minutes later, and when used in 2% solution of five drops for five minutes, the anesthesia lasts three-fourths of an hour. He differs with the other authors in certain statements, and notes slight effect in pupil and accommodation. He repeats that the drug is preferable to cocaine. H. V. W.

OPERATION FOR PTOSIS. (TWO NEW METHODS OF SHORTENING THE MUSC. LEVATOR PALP. SUP.)

Wolff, H. (Ber. Klin. Wochenschr., June 15th, 1896). After citing the history of the operation for ptosis, and explaining the anatomy of the region, he describes his operation, as follows: (1) Under ether narcosis, the upper eyelid is everted, the convex edge of the upper tarsal cartilage being held by the double arm fixation forceps, and the lid again turned over. (2) Snellen's blepharostat is put on the lid. (3) The conjunctiva is seized with forceps and cut straight through with scissors over the muscle; from this the conjunctiva to the left above and below, is undermined. (4) Then a cut about two centimeters long is made to the left. The conjunctival flaps are folded over upwards and downwards, and then the musculus levatorius is seen. (5) A portion about one centimeter wide about the middle of the muscle is raised with the forceps and isolated from the neighborhood, as well as from the underlying tissue for four or five lines by the closed scissors. (6) This portion is held upon two of Schweigger's large strabismus hooks. The Snellen's forceps are then removed. He advocates also, a little spatula, which is divided off into millimeter lines which may be put under the muscle instead of the two strabismus hooks. (7) At the desired distance from the edge of the tarsus, two double-armed catgut ligatures are placed in the muscle. (8) Then is cut and sewed to the remaining portion on the edge of the tarsus; the sutureas are cut close. (9) The wound is closed with catgut ligatures.

After the operation the eye is closed; there is very little swelling of the lids or conjunctival injection. The eyes are occluded by a bandage for five days, which is changed daily. About the 10th day, the patient is dismissed.

He cites three cases, and well illustrates the article. He recommends the conjunctival method on account of its leaving no scar, and of its neatness, when the upper lid can be raised

a little, when there is a small or medium amount of congenital ptosis; but it should not be used in cases of paralytic ptosis.

H. V. W.

UPON MAGNET OPERATIONS.

Hirschberg, J. (Ber. Klin. Wochenschr., No. 25, June 2, 1896; see also Deutsche Med. Wochenschr., June 18, 1896), at a meeting of the Berliner Medicinische Gesellschaft, held April 3rd, 1896, gave statistics of 100 extractions of iron splinters from the inside of the eye, by his electro magnet, the first being in 1879. His average of results showed 14 good results out of 15 cases. To show the difference, he declares that during his first 10 years of practice, he had never seen a good result where there was an iron splinter in the vitreous without the use of the magnet. During the next ten years with the magnet, he had 13 cases, having 7 brilliant successes, retaining good results when observed 10 to 12 years after the operation. He showed a case in which the splinter of steel was 16 mm. long, and weighed about 5 milligrams, which was discovered immediately after the accident, by the ophthalmoscope and sideroscope in the vitreous, being removed by the electro-magnet with perfect result to the vision, and now not even having a scar of the injury. Another patient was shown with a splinter of iron 1 mm. long, in the vitreous of the left eye, attended by considerable pain, small hypopion and swelling of the iris. On the 20th day of observation, extraction under chloroform was happily done; an incision being made behind the ciliary body under and outwards, the magnet being left in for 6 seconds. Perfect healing without loss of vitreous and normal sight and an outwardly normal eye followed the operation and remained 13 months later.

Hirschberg criticises the use of the very large magnet. He defends his own method for most cases. He shows the necessity of removing by forceps, foreign bodies which are caught in connective tissue, for instance, in the angle of the iris, and he demonstrated such a case.

Each case should be treated according to its individual peculiarities. It is certainly a mistake to think that the big magnet can draw out pieces of steel in a mechanical way without any dependence being placed upon the brain and skill of the surgeon, and if such is done, it may be followed by bad results. There are many poor results following the use of the very large magnet.

The indications and contra-indications for the use of the magnet are given.

H. V. W.

CONJUNCTIVAL DIPHThERIA TREATED WITH SERUM.

Ewetzky (Ber. Klin. Wochenschr., Aug. 3, 1896) relates two cases. In one, there was moderate swelling of the eyelids, the membrane could be stripped away easily, the cornea was intact, the disease being distinctly local. In another, the disease had been transmitted from a fatal case of faucial diphtheria; there was diphtheritic affection of the hand, the eyelids were swollen, the membrane separating with difficulty. The bacteriologic examination left no doubt as to the nature of the two cases. In the grave form of diphtheritic or so-called croupous conjunctivitis, there is exudation within the tissue, successive necrosis and cicatrization, frequent and severe corneal complications. The prognosis is very unfavorable. In the superficial form of the disease, the diphtheria may also extend to adjacent mucous membranes, and later produce severe symptoms. Ewetzky thinks that local conditions have a bearing upon the extent, development and course of the disease. The local treatment adopted in these two cases, was the use of weak sublimat solution and stripping off of the membrane, the latter being done chiefly for bacteriologic purposes. In both cases the disease was progressive, but on the day after the injection of the serum, improvement set in, the membrane becoming thinner, more transparent and more easily detached. Both patients recovered. The author has noted in the literature, 27 cases treated with serum, in 6 of which no bacteriologic examination was made. In 21 of these, treatment was quite effective. The author admits that the superficial form usually get well, but he is convinced that no local remedy acts so efficiently in bringing the process to an end, as the serum injections. The rapid improvement is the best protective against corneal lesion. He recommends disinfective lotions, the membrane to be removed, provided no injury be caused the underlying tissue. If the secretion be purulent, the use of nitrate of silver is desirable. The author concludes with a strong recommendation for the use of serum in these conditions.

H. V. W.

EUCAIN IN OCULAR PRACTICE.

Best (Deutsche Med. Wochenschr., Sept., 1896) has an article similar to those of Vollert and Vinci (reviewed in *Annals*, July, 1896), describing the chemical nature and physiological action of eucain. He concludes that its action is about the same as that of cocain, and that it is quite as destructive to the corneal epithelium.

H. V. W.

**THE TWENTY-FIFTH OPHTHALMOLOGICAL CONGRESS, HEIDELBURG,
AUG. 5-8, 1896.**

Abstracted from the Report by Horstmann and Graefe in the Deutsche Med. Wochenschr., Sept. 3, 1896.

The presentation of the Graefe medal to Prof. Dr. Leber, lent a holiday aspect to the meeting. There were many visitors. The programme had 49 numbers, of which most were given. The first sitting was addressed by Prof. Dr. Von Hippel in a eulogy upon Albrecht V. Graefe, and presentation of the Graefe medal to Leber, who responded in fitting words.

The following is a brief report of some of the papers presented:

Nieden. *Use of the Emmerich-Scholl's Cancer Serum and Formal in Inoperable Ocular Tumors.* Treatment of tumors by erysipelas, is not new. Thirty-one years ago, Busch recommended inoculation of erysipelas in ulcerating tumors. Twelve years before, Niden had reported two cases of irido-choroiditis, which were healed after an attack of erysipelas. Despite the warning of the writer, American physicians had inoculated erysipelas in similar cases with a very sorrowful result. Niden had recently treated two cases of inoperable ocular tumors, with cancer serum, in both cases without an appreciable result. One case was a relapsing melano-sarcoma in a grown man, for which the eye had been removed one year previous. In the second case, a child with glioma of the retina, with a relapse in six weeks after operation. After failure of the serum in these cases, he injected a 2% formal solution which caused sloughing of the outer parts, and seemed to limit the progress of the tumor. He thought that the formal treatment might prolong life of such patients.

Hess, *Previously Unknown Changes in the Lens During Accommodation*, observed the entoptic picture of his own lens during accommodation, finding the following: the lens sinks downwards in repose after the act of accommodation; its position depends in part upon the posture of the head, falling to the right or left, accordingly as the head is forward or backward; the near point changes according to the position of the head.

Czellitzer. *Zonular Tension and Shape of the Lens.* Hitherto accepted theories of accommodation hold that the vertical diameter of the lens becomes smaller during the act. Tscherning has recently reputed this. Czellitzer shows, by actual measurements made by different methods, during rest and during tension of the zonula, that in rest, the lens is some-

what ellipsoidal, its radius of curvature is not very small, as Helmholtz describes it, but on the contrary, is large. When the zonula is tense, the radial curvature at the top, especially anteriorly, is not pushed forward, but backward. Greater arching is produced by zonular pressure. Czellitzer experimented upon cows' and calves' eyes.

Von Hippel, *Degeneration of the Retina Through (Retained) Particles of Iron*. This is a resumé of a study of forty-five cases from literature in which the piece of iron remained in the eye and was well borne. Symptoms of retinal degeneration are as follows: 1st. Diminishment of actual acuteness. 2nd. Concentric contraction of the visual field. 3rd. Hemeralopia and loss of the color sense; the earliest one of which is the hemeralopia.

Goldzieher, *Retinitis Proliferans*, considers that cases are usually from syphilis and the results of recurrent retinal hemorrhages due to endo- and peri-arteritis. Cases of spontaneous R. proliferans may arise from increase of the Müller fibres, and of the membrana limitans, causing the formation of the membranes.

Goldzieher, *Hutchinson's Changes in the Fundus*, considers to be the same as has been described by Fuchs, under the title of Retinitis Circinata. Had nine cases.

Segrist reports a case of a *Seldom Observed Retinal Disease* which at first, was considered to be retinitis circinata, but in which the diagnosis was revised, as the retinal changes were believed due to disturbances of circulation in the vessels, the cause being a heart lesion. Most of the changes were albuminous exudate, and were certainly not a fatty degeneration, as they were liable to change in appearance and position.

Schmidt-Rimpler, *Atrophy of the Macular Fibres in Diabetes*, considers that this condition is relatively common. There is a central scotoma due to retrobulbar retinitis, and all cases of central scotoma should have the urine examined for sugar. In these cases, the central scotoma is not due to tobacco and alcohol. There are sometimes ophthalmoscopic changes observed, being usually hyperemia or anemia of the macula. Smoking and other obnoxious habits are to be forbidden and anti-diabetic diet pursued.

Straub, *Hyalitis and Uveitis*. Cases in which the vitreous and uvea are affected, are generally described as cyclitis. He had made experimental inoculations in rabbits' eyes, and pathologic and ophthalmic examinations. In hyalitis there are

found leucocytes in the vitreous, in the retina and in the capillary vessels of the uvea. The outer part of the uvea remains free. In three cases he found a genuine uveitis in which the vitreous remained clear. All these eyes had caused sympathetic ophthalmia.

Graefe, *Anatomical Basis of Pseudo Glioma and Pseudo Tumors of the Eye*, examined cases of glioma from the Berlin University Clinic, finding in many cases, that those clinically diagnosed as glioma, were eventually found not to be so, but other conditions were found after enucleation. Such cases have been called Pseudo-glioma. He recommends in such cases, a fresh examination, in order to determine the true nature of the growths. Glioma is a soft, gray-white brain-like growth which, microscopically examined, can not be taken for anything else. Other intra-ocular affections like detachment of the retina which come through exudative choroiditis and have a yellowish reflex, look somewhat like true glioma. It is thus clinically difficult to make a differential diagnosis. Besides these, there are a number of cases in which there is a yellowish-green subretinal exudate with cholesterin deposits. In all the exudate becomes organized and makes a mass which often contains wandering cells and cholesterin. This follows inflammation of the choroid, and is usually due to contagious disease, meningitis, scarlet fever, tuberculosis, or syphilis.

Hirschberg, *Carcinoma Spongiosum*, examined a case of carcinoma spongiosum of the posterior surface of the iris, in a 26 year old man who had been blind for 1½ years. He considers the case one of lymphoid carcinoma.

Sattler described the *Elastic Fibers of the Sclera*.

Hoffmann, *Operations upon the Tear Sac and for Ectropion*. He extirpates the tear sac under 4 to 5 per cent. cocain anesthesia, which is injected through the caruncula. He occludes the tear duct in cataract extraction, in order to prevent infection. In ectropion, he takes out a piece of the mucous membrane, which in the senile form, is wedge-shaped.

Schirmer, *Trial of a Radical Operation for Scleral Ectasia*, considers that most of the operations are unsatisfactory. In many cases one can make an iridectomy and afterwards use compress bandages. In some cases enucleation is the only recourse. In his operation he removes the staphyloma in toto and brings the edges of the wound together with silver wire, covering the defect by intact conjunctiva. In 14 days the wire

is removed. He had only operated in three cases. In the first one he had preserved some vision.

Axenfeld, *Etiology of Conjunctival Inflammations*, had found Koch-Week's bacillus, pneumococci, streptococci, Morax's diplo-bacillus, Bach's micrococcus conjunctivae minutissimus, in simple conjunctivitis.

Leber, *Pathology of Trachoma*. The cause is not yet known. The specific micro-organism has not yet been found. Many micro-organisms are found in the follicles, but not in the cellular tissue of the diseased membrane. This was followed by considerable discussion upon existence and non-existence of the specific micro-organism.

Fuchs, *Fungus Growths Upon the Conjunctiva*, found such in several cases upon the convex wall of the tarsus. When these were removed, cultivated in Petri's cups and examined, the little yellow masses in the conjunctiva were seen to be epithelial concretions. The fungus itself, did not grow in the conjunctiva, but upon it. Fuchs saw five cases.

Vossius, *Cyst of the Conjunctiva and Upper Eyelid*, describes a case which arose from Henle's glands which were filled with an amorphous mass containing cholesterin crystals.

Gelpke, *Acute Epidemic Conjunctivitis*, examined two schools near Karlsruhe, in which an epidemic had broken out, and 22% of the children had been affected, all of which had occurred within two days. In 7 to 8 weeks all the children were well. The secretion was found to contain the bacillus xerosa. This was considered in the discussion to be the same as Morax's bacillus.

Groenouw, *Exhibition of Cocain in Glaucomic Conditions*. Cases are yet observed in which an acute glaucoma has been caused by the use of atropin. In the text books the use of cocain in glaucoma, is condemned. Groenouw, however, had used 2 per cent. cocain in some cases of glaucoma, with some relief, especially combined with eserine.

Pflüger, *Keratitis Parenchymatosa*. Several infectious diseases which may cause uveitis, may result in keratitis parenchymatosa. For example, Pflüger showed three etiologic conditions which have been but little known. 1st. The disease of agolactia contagiosa in goats, which were seen in 1893, and reported by Hess and Guillebeau. The animals had been examined by Pflüger, who had found keratitis parenchymatosa similar to that occurring after influenza in men. Pflüger

draws relation between uveitis, followed by parenchymatous keratitis and chronic dermatitis, and reports two cases of psoriasis, complicated by lichen ruber, which also had parenchymatous keratitis. 3rd. He referred to 30 cases of the disease seen after influenza. He distinguishes three clinical forms of the disease: (a) The typical classical form in old but not syphilitic individuals. (b) A form which has been described by Stellwag, as keratitis annularis. (c) A form which is combined with a sero-fibrinous iritis, the exudate of which is deposited upon the posterior surface of the cornea, and in which the circulation could be studied with a binocular loupe.

Wagenmann, *Eye Disease and Gout*, showed that this condition should have attention in its relation to eye disease. He had seen a large number of gouty eye diseases in patients in which the diagnosis could not be doubted. Gout causes seroplastic inflammations with or without uric acid concretions: for example, he referred to many cases of scleritis, iridocyclitis with concretions between the choroid and retina, lumps in the sclera, and a characteristic case of episcleritis periodica fugax. Gout may cause indirect eye diseases, especially of the blood vessels and early atheroma. Here may be observed recurrent vitreous diseases ending in cataract, detachment of the retina, and leading to retinitis hemorrhagica; sclerosing corneal diseases may occur. He had observed a relation between glaucoma and gout in a number of cases. This was freely discussed and concurrence with the writers' opinions expressed.

Darier, *Importance of Local Therapeutic Measures in Infectious or Sympathetic Irido-choroiditis*, reported a case of sympathetic disease of the eye in which he obtained the best of results by subconjunctival injections. Two months after enucleation, inunctions of mercury and hypodermic injections of cyanid of mercury were given. After this subconjunctival injection, as phthisis bulbi threatened, a hypodermatic syringe of cyanid of mercury, 1:5000 was injected into the equator, and the anterior chamber opened in order to allow a change of the liquid in the eye. After eight such injections, he obtained visual acuteness of $\frac{3}{4}$. He reported two further cases of post-operative irido-choroiditis.

Weiss, *Transplantation of Conjunctival Flaps*. In order to prevent staphyloma in ulceration of the cornea, attended by iris prolapse, Weiss covers the perforation of the cornea with conjunctival flaps. He claims that the ulcer heals quicker, and that the iris does not further protrude; that the conjunctival

flaps do not become infiltrated, but heal quickly. He had good results in three cases.

Alexander, *Recovery of Function After Embolism of the Central Artery of the Retina*, occurring six years before, in a 51 year old man, who was seen with a fresh embolism of the right eye, having had an old embolism of the left eye six years before. Was given digitalis, and the vision of the left eye improved from 1/X, and remained at 5/X. Alexander considers that there was a partial stopping of the blood-vessels, and under the use of digitalis infusion and a much greater *vis-a-tergo*, more blood was carried through the partly stopped vessel.

Fukala, *High Grades of Myopia and Recording High Grades of Ametropia*, recommends that high grades of myopia be recorded by the number of the glasses used for correction of parallel rays and their distance from the cornea.

Axenfeld, *Mild and Innocuous Metastatic Inflammation of the Eye Occurring in General Sepsis with Bilateral Thrombosis*. Endogeneous purulent inflammation of the eye comes from entrance of the micro-organism carried by the blood, and sometimes causing a local, mild inflammation, such as interstitial neuritis, and may also act with little virulence. He showed a microscopic illustration in which the pneumococci had accumulated in small areas looking like choroiditis disseminata or ordinary retinitis. These had caused but little irritation, although there was septic retinitis. The double-sided thrombosis of the retinal and choroidal veins came from general infection, and not from the local action of the bacteria. This occurred through stoppage of the circulation. Bilateral metastatic inflammation, such as occurs in the puerperium, is to be explained in the same way.

Vossius showed *Microscopic Specimens and Photographs of a Case of Congenital Microphthalmus*.

Bahr, showed an interesting case of *Congenital Periodic Exophthalmus of the Left Eye*, which occurred in a ten year old boy when he looked to the right.

The last day was given up to exhibition of preparations in which a large number were shown.

H. V. W.

FILARIA OF THE RETINA.

De Mets (Belg. Med., June 11, 1896), records a case of a woman aged 46, who came in Jan., 1890, complaining of lessened vision in left eye. (Vision 5/X.) Ophthalmoscope showed macular retinitis, with white spots similar to nephritic retinitis; inflammation spread, and disk showed changes; vision reduced to perception of light. Urine albuminous, no casts. Patient was put on milk. Was not seen again until Jan., 1895, when she came complaining of right eye. In the interval she had abscesses of legs and arms, which had been opened. The urine had been albuminous, and on three occasions in 1893, nematodes, like embryos of filaria, had been found, the urine appearing chylous. On the first occasion there were two nematodes, and portions of another; on the second, they were said to be "particularly numerous," on the third, "only a few nematodes." The blood was examined twice without result. In January, 1895, the left eye showed no trace of retinitis, and vision was normal; in the right eye vision was also normal, but in the lower part of the field there was a circular scotoma of about 10 degrees in diameter, and on examination there was found an opaque detachment of retina corresponding to it. A few days later the detachment was occupied by a hemorrhage. Patient was again lost sight of. De Mets assumes a filaria in the retina to account for these appearances, having been led to do so by the fact that there were, at one time, nematodes in the urine, and by the spontaneous occurrence of abscesses in the limbs.

H. V. W.

UPON FILARIA LOA GUYOT IN THE HUMAN EYE.

Ludwig, H. & Th. Saemisch (Sond. Abdr. aus: Ztschr. f. Wissenschaftl. Zool., LX, 4, 1895). A Russian marine officer who had explored in Africa for four years, who for some time had been in the sanitarium in Bonn, suddenly felt pressure and pain in the eye, and on looking in a mirror, noticed a thread-like body with lively movements downward and outward from the cornea, in the place where the conjunctiva was reddened. An ordinary incision being made in the conjunctiva, Saemisch removed a lively worm. The wound and the inflammation of the conjunctiva rapidly healed. The worm, which was examined by Ludwig, was a filaria loa. This is the first example of such a case which has been seen by a zoölogist in Europe and has been described and pictured thoroughly in the article. The worm was 1 mm. long, and 0.5 mm. thick. It was a living

white female worm full of young ones in stages of development from the egg to the complete larva. Ludwig believes that the larva, which was first seen under the conjunctiva, had been deeper in the orbit. It is safe to say that it was carried there as a hematozoon in the blood, as there was no evidence of conjunctival wound.

H. V. W.

BLINDNESS WITH BILATERAL BRAIN DISEASE AND LOSS OF EQUILIBRIUM.

Anton, G. (Separatabdruck aus den Mittheilungen des Vereines der Aertze in Steiermark, 1896, No. 3), gives an excellent clinical and anatomical description of a case in which there was destruction of the brain substance upon the convexity of both posterior lobes in which the relations of the functional symptoms to the anatomical lesions are of considerable interest. In a 50-year old person there was blindness without objective symptoms in the eyes, which had central scotomata, with retention of small visual fields. The patient did not notice the loss of the sight. She retained optical memory, but did not endeavor to recognize new visual impressions. She had lost the sense of equilibrium and power of taking her bearings, but no connection could be traced between this loss of sensation and the visual impressions, but it was considered rather to improper audition in localizing sounds. The tactile and the muscle senses remained perfect. Amnesic aphasia and left-sided hemi-paresia occurred a short time before she died. There was found at the post-mortem a large necrosed cyst in the brain substance of the posterior lobes reaching from the ventricle outwards on the right side and upwards, destroying angular gyrus and the cortical substance of the occipital lobe. The cortex and the marrow of the median part of the end of the posterior lobe remained intact. The communication between the forceps corp. collos, the fasciculus arcuatus, the fasciculus fronto-occipitalis, the fasciculus longitud. inf. and the corp. quad. was interrupted and degenerated. Anton considers that he blindness resulted from injury to the central optical fibers. The psychical circumstance that the patient did not know of the blindness, and yet both eyes had two large blind spots, is considered to be due to the isolation of the two optical lobes from each other and from the rest of the brain tissue, and it opens up the possibility that this condition also occurs in atrophy of the brain. Anton comes to the conclusion from other cases in the literature and from his anatomical facts, that injuries to the brain, which are accompanied by blindness due to lesion of the posterior lobes,

give rise to many more psychical functional disturbances than is the case when the injury is confined to the median wall. The sense of sight is a decided portion of the sensation of equilibrium, but orientation is due to associated action of several central cells.

H. V. W.

EXPERIMENTAL AND CLINICAL REPORT UPON SUB-CONJUNCTIVAL INJECTIONS OF SUBLIMAT.

Radswicky, P. J. (Inaug. Diss. Moskau, 1896.) The author reviews the subject under the following headings: 1st. Chemical Investigation of the Retention of Mercury in the Ocular Membranes after Sub-conjunctival Injection of Sublimat. 2nd. Investigation as to the Diffusion of Sublimat into the Eye from the Conjunctival Surface. 3rd. Observation as to the Therapeutic Value of Injections in Different purulent Ocular Lesions in Animals. 4th. Clinical Observations. He made sub-conjunctival injections of mercury in animals and enucleated the eyeballs at different periods of time, varying from $\frac{1}{2}$ hour to 48 hours, then subjected the specimens to the following tests: The eyeball was cut in pieces, placed in a vessel covered by concentrated sulfuric acid, after complete charring, the glass was shut up in a Kjedal's globe and heated for 12 to 24 hours, to fully remove the fluids. The remains were placed in a test tube and submitted to electrolysis for 24 hours, the cathode being a gold rod, the anode a platinum wire, the battery consisting of 6 Meidinger's elements. The quicksilver is removed from the gold rod by heating, placed in a thin glass tube and changed into the biniod of mercury by placing a crystal of iodine in the cool portion of the tube. This method will detect as little as 1/60 milligram. More than 70 eyes of dogs were examined after injection of $\frac{1}{4}$ hypodermatic syringe full of sublimat 1:1000 or 1:3000 under the conjunctiva, but in no case was it possible to detect a trace of quicksilver in the ocular tissues. On account of these negative findings, he seriously questions the diffusion of sublimat through the living or dead cornea. In order to intensify the diffusion process, in more than 50 cases he irrigated the conjunctival cul-de-sac with 1:3000 sublimat, with and without mixing it with sodium chlorid solution, and extracted the aqueous humor, testing the same for quicksilver. In all of these cases he found evidence of the entrance of the mercury into the eye, and from this he reasons that sublimat may gain entrance into the eye through continuous irrigation of the conjunctival cul-de-sac as well as atropin, eserine and fluorescein. Experimental infection of the eye was made in dogs by staph. pyog. alb. aur. and citr.

The same lesions were made in both eyes, but injection of sublimat made only in one eye. In no case did he see a more favorable result upon the course of the suppurative process in the injected eye than in those which received no treatment. In 64 clinical cases of different ocular affections (ulcus corneae cum et sine hypopion, keratitis parenchym., iritis, chorio-retinitis, etc.), treated by 1:3000 and 1:000 sodium chlorid solution in Prof. Krjukow's and Ewetzky's clinics, he reached the conclusion that the course of these diseases was seldom favorably influenced by the injection of sublimat. From these chemical and therapeutic (in dogs) and clinical results, he concludes that the therapeutic worth of subconjunctival injection of sublimat, tri-chlorid, para-chlor-phenol and other drugs, is not due to their antiseptic qualities, but to their irritant action.

H. V. W.

TUBERCULOSIS OF THE CONJUNCTIVA.

Franke, E. (Festschr. zur Feier des 80 Jahr. Stiftungsfestes des aerztl. Vereins zu Hamburg; Leipzig, 1896.) In a 7-year-old boy of healthy parents, there appeared numerous blisters on the ocular conjunctiva, and little follicles in the retrotarsal fold of the lower lid, together with swelling of the pre-auricular gland of the right side. In a piece taken for examination, there were giant cells and tubercle. A small portion of the excised conjunctiva was placed for experiment in the anterior chamber of a rabbit's eye; a tubercle of the iris formed in which bacilli were found. In the case of the boy the entire diseased spot of the conjunctiva was removed, together with the pre-auricular gland. For a year afterwards the boy remained without eye disease. Franke quotes the literature of the subject.

H. V. W.

TREATMENT OF HYPOPION KERATITIS IN THE OPHTHALMIC CLINIC AT BASEL.

Wehrle, Reinhard. (Inaug. Dissertation in Basel, 1896.) After a historical retrospect upon the many medicines and methods that had been used in ulcer septicum corneae, Wehrle describes cases of suppurative corneal inflammation, and the several methods of treatment followed in the Basel Eye Clinic since the year 1890. He recommends linear cauterization of the lower conjunctival fold with lunar caustic, as well as subconjunctival injection of sodium chlorid. As a prophylactic, he recommends gutta-percha occlusive and the laced bandage. He gives the preference to this treatment above iodoform, sublimat subconjunctival injection and paracentesis of the cornea. He especially considers dangerous the actual cautery which has been used by

so many other oculists with such brilliant results, and which at the last Ophthalmological Congress at Heidelberg, 1895, had such warm adherents. H. V. W.

SHALL GRANULATIONS BE TREATED LIGHTLY OR HEROICALLY?

Crainiceau, G. (Klin. Monatsbl. f. Augenhkde, XXXIV, March, 1896) has had a large number of cases in civil and military life for years. Thinks that many oculists err too much in using unaccustomed medicines and heroic treatment. He calls the squeezing and bursting of the granular conjunctiva a "barbarism." He considers that this form of treatment is similar in results to that which has been called the "abortive cure for urethral blenorrhea." Some cases are immediately cured; in others there is more damage done than good. Crainiceau ordinarily applies sublimat solution, 1:1000, by the brush; uses the galvano cautery only in dry granulations, the nitrate of silver only where suppuration is present, and cuts away large hanging granulations with a scissors. He prescribes mild collyria in the beginning of the treatment. Sulphate of copper is only used in very old cases in his private practice.

[H. V. W.]

THE ETIOLOGY AND TREATMENT OF GLAUCOMA.

Wicherkiewicz (Klin. Monatsbl. f. Augenhkde., XXXIV, May, 1896) has noted and believes that glaucoma may follow syphilis, arthritis, the diseases of pregnancy and also reflex causes, and that by treatment of the general disease the eyes may be cured without operation. He does not consider that iridectomy should be done as soon as the diagnosis of glaucoma is made. Previous treatment by eserine and also injection of morphia facilitates the operation. In young persons having subacute glaucoma, he makes a double sclerotomy, passing two lance knives towards each other from opposite sides of the angle of the anterior chamber. Should this not be sufficient, on account of renewed tension and further loss of vision, in older cases he makes an iridectomy. In chronic glaucoma he employs eserine, sclerotomy, or removes a small piece of the peripheral portion of the iris.

[H. V. W.]

NOSOPHEN IN OPHTHALMIC PRACTICE.

Hoor (Klinische Monasbl. f. Augenhkde, May, 1896) reports favorably on this substance as a substitute for iodoform. It is a compound of iodine and phenol, containing 61.7% of iodine, a brown, odorless powder, insoluble in water and acids, soluble

with difficulty in alcohol, most soluble in ether and chloroform, and easily soluble in alkalis. It is very slightly, if at all, poisonous. When dusted into the eye it causes no irritation, and has been employed by Hoor in divers cases with favorable or not unfavorable results; as, for instance, in ulcers of the cornea, prolapse of the iris, burns and other wounds of conjunctiva and cornea, skin wounds, etc. Even when introduced into the anterior chamber of rabbits it causes no irritation.

[H. V. W.]

EPITHELIOMA OF EYELIDS AND FACE.

Dr. Julius v. Siklossy, Jr. (*Klinische Monats Blätter für Augenheilkunde*, June, 1896) reports two cases cured by radical excision and plastic operation, at Buda-Pesth:

The first case was a woman, 78 years old, who had had for three years a tumor (origin unknown) growing on the outer side of the left lower lid. This had been cauterized six months previously. The conjunctiva was involved, but preauricular glands not involved, although a submaxillary gland was enlarged and movable. In the operation, the eyeball was enucleated and the orbit eviscerated; two-thirds of the upper and the entire lower lid were removed, all incisions being made in healthy tissue. All denuded surfaces were covered by a flap from the forehead, left adherent by its pedicle. With iodoform and a bichlorid (1:5000) wash there was no pus, and healing resulted by first intention. Five months afterwards there was no return of the tumor.

The second case was an elderly woman with a growth two years old. The inner third of the upper lid, the skin of the nose to the middle line, and the entire lower lid, were involved, and suppuration had already started. The eyeball remained unaffected. The operation was radical, all diseased tissue being removed by incision in healthy tissue. A forehead flap, with pedicle, covered the denuded surface. Radical extirpation and careful antisepsis seemed, in both cases, to obliterate the danger of recurrence.

[A. B. H.]

GLAUCOMA AFTER CATARACT OPERATIONS.

Dr. K. Rumschewitsch, of Kiew (*Klinische Monatsblätter*, June, 1896), discusses this question. Referring to the earlier observations of A. v. Graefe, in 1869, he says that it is only since 1887 that careful study has been made of this post-operative accident. He quotes Pagenstecher's reports to show what careful study will bring to light, and that pathological ob-

servation leaves no doubt that glaucoma may develop immediately after a cataract operation, quite independently of the incision used or of any detectable cause. The same result may take place during the third or fourth week—in fact, any time after the operation. This deplorable and unavoidable accident needs, therefore, a most careful study.

Glaucoma, after capsular excision, remarked by Bowman and Albrecht v. Graefe, has been discussed anew by Knapp and Pagenstecher.

Rumschewitsch thinks it advisable to report in detail his cases of glaucoma, as follows:

Case 1. Clergyman; 78 years old; healthy in all respects; O.D. Cataracta incipiens, V=20-70; normal fundus and tension; good pupillary reaction; O. S.; cataracta matura with large nucleus; pupil intensely dilated by atropin; normal projection and tension. Operation with broad iridectomy. On attempting to extract a capsular fragment, the whole lens, with its capsule, escaped; anterior chamber restored within twenty-four hours, and for forty-eight hours everything went well. During the third night there was pain in the left (operated) eye, and the typical symptoms of glaucoma followed. With eserine (2% solution) the normal condition was restored at the end of two weeks, and the patient dismissed with orders to resort to eserine at the slightest pain, and to return to the hospital. For six months everything went well and vision improved somewhat, but during the eighth month an attack of bronchitis reduced his strength, after which the visual activity declined and he had momentary spells of pain. Nine months after (at the hospital again), V-15-200; field was restricted, tension increased, disc excavated. Sclerotomy was performed with benefit, followed by broad iridectomy. At the end of a year, V-20/100-70, but with field much contracted. The right eye was now ready for the operation, but showed itself perfectly normal in every way, reacting well to light and to atropin. The operation was very similar to that on the left eye, except that eserine was used immediately thereafter. Within twenty-four hours, however, there were glaucomatous symptoms, which in spite of miotics and operations, continued for some time and left indelible traces.

Case 2. Locksmith; 52 years old. O. S. Cataracta incipiens; O. D. Cataracta matura, with good response to light and atropin. An easy operation with iridectomy was performed. A normal healing was reported till two weeks afterward, when

there was some increased tension and narrowed field, with $V=20/200$. Three weeks afterwards, during an attempt to make an extensive iridectomy, there was a decided loss of hard vitreous, and from now on a typical, chronic glaucoma resulted.

Case 3. Teacher; 57 years old. O. D. Cataracta incipiens; O. S. Cataracta matura. The operation (with iridectomy) and healing were normal, and this condition lasted practically a year, when a dissection for secondary cataract was performed. Twenty-four hours afterwards glaucoma developed, but was completely subdued by eserine and an iridectomy.

[A. B. H.]

THE TOLERANCE OF THE ORBIT TO FOREIGN BODIES

Is illustrated by an article by Prof. E. Adamuk, of Kasan (*Klinische Monatsblätter für Augenheilkunde*, June, 1896), in which he narrates two cases for the sake of contrast:

Case 1. Student; 16 years old; treated seven years previously by the reporter on account of a swelling of the upper right eyelid, on which a small suppurating fistula was found leading to some firm, flat substance beneath. Otherwise the eye was normal. The history showed that several weeks previously, a tumor, from some unknown cause, had developed on the lid, which, since then, had never been quite well. An operation permitted the removal of a rectangular piece of glass about two centimeters square. The wound then healed by first intention. The patient had no knowledge of any accident, but the mother remembered that eight years previously (when the patient was a mere child) he had been asked one day to fetch a glass of water for some visitors in the garden, but in his haste had fallen and broken the glass, producing, at the same time, a wound on this upper lid. This wound, however, healed promptly, and nothing more was thought of it. There can be no doubt, therefore, that infection was escaped, and that the piece of glass was retained eight years in the lid, till some irritation caused the suppuration that led to its discovery.

Case 2. Lawyer and sportsman. Shows a great contrast to the foregoing. The patient was in a thick wood, and, being missed by his friends, was finally found face downward and unconscious, on the ground. On the right upper lid was a small wound. The eye was uninjured. The patient soon after died in the hospital, and the post mortem showed that a twig, twelve centimeters long, had penetrated the roof of the orbit and pierced the brain, but had broken off within the wound.

A comparison of the two cases shows that there is no uniformity in the thickness of the roof of the orbit, and that what may be a trifling injury to one person, might, on account of a very thin bony covering, have been the death blow to another.

[A. B. H.]

MULTIPLE LACERATION OF IRIS BETWEEN PUPIL AND CILIARY REGION

Is reported by Dr. Westphal, of Strasburg (*Klinische Monatsblätter für Augenheilkunde*, June, 1896), with a literature of similar (and very rare) accidents.

A soldier was injured by a blow from a footstool on the right eye. The next day the lid reddened, and within the bulbar conjunctiva, particularly below and inward, there was moderate hemorrhage. The cornea was clear, except for a slight cloudiness of the adjacent quadrant, and this soon cleared up. The iris was normal, but there was paralysis of the sphincter and trembling—no laceration. On the posterior capsule there were punctate deposits, due, presumably, to some vitreous hemorrhage. Fundus not distinct. V (later on) 6/18. Ten days later, when all traces of hemorrhage had been absorbed, the fundus could be seen, and the unusual appearance of the iris was made evident; there were three perforations in the tissue, extending radially, looking as if having been made by a needle; these holes disappeared on myosis (eserin) and returned when the drug action ceased. Oblique illumination revealed only slight furrows in these areas. Otherwise the iris was normal. For three months, at least, the condition remained the same.

The reporter calls the attention of observers to the fact that his and other cases were all due to blows by a blunt weapon, and that they were first detectable several days after the injury. Probably the laceration occurred at the time of the blow, but was covered by a blood clot. Care should, therefore, be exercised in examination, and eserine treatment should be begun at once, unless contra-indicated by other symptoms or signs.

[A. B. H.]

**AN EXPERIMENT WITH A FOREIGN BODY IN THE ANTERIOR CHAMBER
(RABBIT'S EYE)**

Is reported (advance sheets) by R. Denig (*Klinische Monatsblätter für Augenheilkunde*, June, 1895) to help study the problem of the lymph circulation. The reporter was invited to the experiment by the phenomena presented in a clinical case. A man 28 years old had been injured in the right eye by a splinter

from a cartridge. The bit of metal pierced the cornea, lens and vitreous, and lodged on the retina near the macula lutea (as seen by the ophthalmoscope). Four weeks afterward it became detached from the retina, then gradually sank to the floor of the vitreous and remained there for years. The lens meanwhile became opaque and was finally removed with success. Four and a half years afterwards, the foreign body appeared in a fold of the iris. It had meanwhile become encapsulated. Within five months it pierced the iris and cornea, and was discovered in time to be preserved. The reporter had noticed that before the foreign body had escaped from the iris, its leucocyte capsule left in its trail a slender fibrous band, free at the far end, and that this free end floated in the anterior chamber till it became finally attached to the capsular remnant left by the lens. To study the lymph current in the anterior chamber the reporter placed this foreign body within a rabbit's eye, pressing it against the posterior surface of the cornea, out of the iritic filtration angle. During the next several months a strange journey was made by the bit of metal; it passed across the pupillary area, then behind the iris; appeared again, disappeared within the iris tissue (although atropin was continuously used), and finally escaped detection, probably having passed to the posterior aspect of the lens with the intention of exploring the vitreous. The track of the metal can be followed by a thin opacity on the back of the cornea. The rabbit is still used for purposes of demonstration, but complete mydriasis reveals no trace of disease or of foreign body. The cause of the journey and the influences of the lymph currents, the reporter hopes to discuss later.

[A. B. H.]

A SIMPLE DETECTION OF ONE KIND OF SIMULATION.

This is illustrated by Dr. Helmbold (*Klinische Monatsblätter fuer Augenheilkunde*, June, 1896): At the usual testing distance have the usual chart, say **2 3 4**, and another ready for use with the numerals reversed, that is, as they are seen in a mirror, **4 3 2**. The patient declares that his usual acuity (of one or both eyes) is not greater than 5-35. After correcting all refractive errors, he still says it is only 5-35. The room must then be so arranged that at one-half the testing distance behind him there is a mirror. Now turn the patient round so as to face the mirror, and get the reserve test card in place. Ask the patient to read—he thinks he must still halt at the 5-35 line (if simulating), and consequently reads just what he read before—but

he proves himself in error, because he has now read the line at twice the original distance! [A. B. H.]

A NEW FORM OF KERATOSCOPE.

Prof. W. Uhthoff, of Marburg, in the *Klinische Monatsblättern für Augenheilkunde*, July, 1896. It is made by the optician Emil Sydow, of Albrechtstrasse, Berlin, is 6 cm. broad, consisting of half the arc of a circle of 15 cm. radius. On the concave side is a series of black and white parallel lines. The arc is movable about a sagittal axis, and the angle of rotation is marked at the back, as in a Foerster's perimeter. It resembles the hand perimeter of Schweigger.

The examination is made the same as with an ordinary keratoscope, but the adjustability of the arc and the alternation of black and white lines adds greatly to the distinctness of variations and irregularities in the corneal curvature, as is well illustrated by several figures accompanying the article.

[A. B. H.]

THE USE OF AETHYLENDIAMIN SILVER PHOSPHATE.

The so-called argentamin in ophthalmic practice, is discussed by Dr. Karl Hoor, Professor at the University of Klausenburg (*Klinische Monatsblättern für Augenheilkunde*, July, 1896). He refers to the results of Schaeffer as reported from the dermatological clinic at Breslau (*Zeitschrift für Hygiene und Infektionskrankheiten*, 1894, XVI Band), and finds them equally applicable to ophthalmic cases. This silver salt is a preparation of phosphate of silver, in 15% solution of aethylenediamin, which gives it an alkaline reaction. It seems to have a greater bactericidal power than the usual nitrate of silver solution; it penetrates deeper, is equally as astringent, causes less pain and can be used in a more concentrated form. The author sums up his results as follows:

1. It possesses all the advantages of the silver nitrate, and none of the disadvantages.
2. The unpleasant subjective symptoms of silver nitrate are not caused by it.
3. It penetrates the tissues deeper and thereby intensifies the antiseptic value of the application.
4. It is especially serviceable as a substitute for the nitrate in the treatment of trachoma.
5. It does excellent service in the treatment of conjunctivitis, catarrhal ophthalmia, follicular catarrh, purulent con-

junctival inflammations, blennorrhea of the new-born and the adult.

6. The result of treatment in each case was at least what might have been expected from the silver nitrate.

7. In active secretion the salt may be applied three or four times a day and oftener without producing any irritation.

8. Corneal complications and pannius offer no contra-indications to the use of the salt; and it is even well tolerated in hyperemic or inflammatory conditions of the iris and ciliary body.

This silver phosphate preparation is best used in a 5% solution, and must be kept in dark bottles, as it easily decomposes.

[A. B. H.]

CARCINOMA OF THE CONJUNCTIVA ORIGINATING FROM A SCAR AFTER EXTENTERATION.

Dr. A. Wagenmann (Klinische Monatsblaetter fuer Augenheilkunde, August, 1896), reports a case from Jena: The patient was a shepherd 70 years old, in whom the left eyeball had been removed for suppuration after a cataract operation about two years ago. A glass eye had been worn since then. For several weeks there had been pain in the orbit, with suppuration. In this left eye the mucous membrane was reddened, congested and covered with pus. Deep within the orbit, on the inner side of the cicatrix, was a warty growth, ulcerous and fissured. Thickened folds of mucous membrane seemed to lead down to this mass. There were several nodules on the conjunctiva. The right eye had no defect.

Under chloroform the mucous membrane was dissected up in healthy tissue so as to include all diseased tissue. With due antiseptic precautions the healing proceeded satisfactorily, and all suppuration ceased. Microscopical examination resulted in the diagnosis of carcinoma. The cause could not be ascertained, but there seems no doubt of the accuracy of the diagnosis or of the certainty of its radical extirpation. [A. B. H.]

A CASE OF ACROMEGALY WITH TEMPORAL HEMIANOPIA.

This is reported by Dr. Franke, of Hamburg (Klinische Monatsblaetter fuer Augenheilkunde, August, 1896). A woman 31 years old, married, with one healthy child, came to consult about visual disturbances, having, apparently, no other cause of complaint. The father was dead (gastritis), mother living but nervous, and no family history of any moment. The ophthalmology

scope showed an optic nerve atrophy; vision was reduced and the temporal hemianopsia was pronounced. The condition suggested changes in the anterior or posterior portion of the chiasm—some tumor of the hypophysis, or at least a hyperplasia seemed indicated, such as is seen in acromegaly. The fat face of the patient was noticeable at once, and the hands show a similar abnormality.

The patient had been pregnant only once, and her menses had ceased some time since. Double vision had at one time been complained of, and a muscle paralysis diagnosed; this had never completely disappeared. Two years ago the picture of acromegaly was quite well developed, and at that time the reduction in visual acuity first manifested itself. The general health was, all along, good.

The hemianopsia was complete, and detypically temporal; some optic nerve atrophy; light sense retained, but color field somewhat contracted.

V. 4-36 both eyes.

Treatment with hypophysis cerebri was tried, with temporary improvement to vision, but no effect upon the hemianopsia. The other characteristic symptoms of acromegaly were all well marked. The reporter cites 174 cases in which 14 had hemianopsia.

[A. B. H.]

AN ATYPICAL CASE OF SPRING CATARRH SIMULATING IDIOPATHIC CORNEAL TUMOR.

This is reported by Dr. Franke (*Klinische Monatsblätter für Augenheilkunde*, August, 1896), from the University Clinic at Marburg.

The patient was a man 68 years old, of a healthy history, except that for several summers he had suffered with a mild inflammation in both eyes, especially the left. During the spring of the preceeding year, he had noticed that this eye was particularly bad, and his friends had remarked a small growth near the lower corneal margin, which gradually extended over the pupillary area.

The present condition was as follows: On the right eye there was a xerotic patch outward and downward, produced by the irritation of two cilia. Cornea unaffected. The left eye, in the same area, covering about 4 sq. millimeters, had a more extensive xerotic patch, but no ciliary irritation. Corresponding to this, the cornea was opaque and somewhat tumified, connected to the conjunctival patch by a pedicle. This tumor was firmly and immovably attached to the corneal tissue. Both lids were otherwise normal.

The xerotic areas were removed by operation from both eyes, that of the left eye being hardened in alcohol and examined microscopically, the result of which, taken with the history, was accepted as logical evidence that the tumor was due to the papillary development of spring catarrh, manifested uniquely upon the cornea. [A. B. H.]

A CASE OF LENTICONUS POSTERIOR.

This is reported (Klinische Monatsblätter fuer Augenheilkunde, August, 1896), by Dr. Cramer, of Cottbus. Mueller's statistics (Klin. Monatsbl. f. Augenheilkunde, 1894, p. 178), with two other cases, contain all those hitherto reported. This case was accidentally discovered when making the skiascopic examination, in a girl of nine; it was noticed in moving the mirror at one meter's distance, that the shadow acted at first as it would in hyperopia; however, as it reached the center of the anterior surface of the cornea, it was reversed and became distinctly smaller, then brighter, and finally resumed its original character. In approaching the (plane) mirror there was seen, above the axis of the lens, a regular, round dark spot surrounded by a bright band, like Saturn and its ring. Parallaxic displacement showed that the phenomenon took place at the posterior pole of the lens. Knapp's comparison with a drop of oil, suggested lenticonus, which was confirmed by further examination. There was no opacity in the lens or capsule, but there was discovered a refraction of +3.0 D. at the equator, and of -11.0 D. at the center, a difference, therefore, of 14.0 D. With a correcting lens the disc and vessels could be plainly seen. Images at the posterior lens surface could not be demonstrated, nor the shape of the lens made out; probably it was nearly spherical. There was also a corneal astigmatism, so that glasses produced no improvement beyond the original vision of fingers at 16 feet, till a perforated disc was tried with a strong concave lens.

[A. B. H.]

ABSTRACTED REPORT OF PROCEEDINGS OF THE
AMERICAN OPHTHALMOLOGICAL SOCIETY, IN
SESSION AT THE PEQUOT HOUSE, NEW
LONDON, CONNECTICUT, JULY
15TH AND 16TH, 1896.

The meetings were presided over by Dr. Geo. C. Harlan, of Philadelphia.

Memorials were read on the deaths of Drs. Williams, Heyl and J. F. Noyes.

The following papers were read and discussed:

"THE COURSE AND PROGNOSIS OF MALIGNANT ORBITAL TUMORS, AS INFLUENCED BY SURGICAL OPERATIONS FOR THEIR REMOVAL."

Dr. C. S. Bull, New York.

Dr. Bull's conclusions were: "1. The prognosis of all forms of malignant orbital tumors, whether primary or secondary, is unfavorable; and if the tumor be primarily in one or more of the deep facial bones or their sinuses, the prognosis is positively bad. 2. Except in the case of encapsulated tumors of the orbit, surgical interference is almost invariably followed by a return of the tumor and the growth of the secondary tumor is more rapid than that of the primary lesion. With each succeeding operation, the period of quiescence in the return of the tumor grows shorter, and the rapidity of the growth increases. 3. The patient's family, and in certain cases the patient himself, should in the beginning be told of the serious nature of the trouble and be warned that complete removal of all the diseased germs is a well-nigh hopeless task. The burden of the decision as to surgical interference must rest upon the shoulders of the patient. 4. Repeated operations in these cases undoubtedly shorten the life of the patient. While it is therefore our duty to operate in all cases, in order to relieve severe, or unbearable pain, we should be slow to operate merely for the sake of relieving temporarily physical

deformity, especially if we are convinced that by so doing we shorten the life of the patient, even if that shortened life is rendered more bearable to the patient."

DISCUSSION.

Dr. H. Knapp, of New York, fully endorsed the prognosis given except as it related to tumors of the optic nerve and of the lachrymal gland. He stated that the latter were not primarily very malignant and that no relapse may occur for many years.

Dr. Gruening, of New York, endorsed this opinion.

Cases were reported by Dr. C. J. Kipp, of Newark, and Dr. W. B. Johnson, of Paterson, in which long periods had elapsed before any recurrence of the tumor.

"Tumor of the Optic Nerve in a Child Aged Three Years and a Half."—Dr. S. D. Risley, Philadelphia.

"Mary B., aged 3, small, badly nourished child, brought to the hospital because of swelling of right eyelids which began three years before. Lids were oedematous and discolored and together with the dropsical conjunctiva completely concealed the cornea. The conjunctiva had to be incised twice and hot compresses used for several days before satisfactory study of the cornea could be made. This tissue was found steamy, the ball hard, pupil large and a yellowish reflex from the interior of the eye was visible. It was regarded as malignant intra-ocular growth and enucleation advised. After two days in the hospital the hardness of the ball, oedema, chemosis and exophthalmia had so far disappeared that operation was deferred and in two weeks the child sent to its home, but kept under observation at the clinic. In two weeks the increased tension returned and the lens was pressed forward into the anterior chamber. The ball was then enucleated. The optic nerve was lost in a neoplasm which filled the apex of the orbit and closely invested the posterior surface of the globe. The ball and tumor were preserved in formaline and on subsequent section and study was found to be a gliosarcoma, which had apparently begun in the optic nerve, and penetrated the ball, filling the posterior two-thirds. The choroid had entirely disappeared."

"A CASE OF OSTEO-SARCOMA OF THE SUPRA-ORBITAL MARGIN AND OTHER PARTS OF THE SKULL."

BY DR. H. KNAPP, NEW YORK.

"The patient, a man of 63. Two months ago a swelling appeared at the outer half of the brow, accompanied by protrusion of the eye forward and downward, and stupor. The swelling

was about 2.5 cm. in diameter, the border presenting a hard ridge, continuous with the surrounding bone, the centre slightly depressed and of fleshy softness. Below the superior orbital margin there was a tumor of tendinous hardness under the periosteum, extending backwards into the orbit, its posterior limit not reached on palpation. Movements of the eye good. My opinion was a periosteal sarcoma with osseous spicula and I advised an exploratory incision. Prognosis bad. The patient, however, sank rapidly and died four days later. At the autopsy it was found that the supra-orbital tumor had pierced the frontal bone above the brow and rested as a spherical, soft, uneven mass, the size of a walnut, on the horizontal plate, which it had also pierced and rested on the periosteum beneath. It also extended through the superior orbital fissure into the middle cranial fossa. Independent of this tumor, in the anterior part of the skull, there was another larger one, of the same kind, springing from the lateral portion of the superior surface of the petrous bone, involving in its growth the adjacent part of the cerebellum. Still another similar mass was found to have corroded the right parietal bone near the vertex. Microscopically all these tumors exhibited the uniform picture of a large round celled sarcoma."

"A CASE OF TUBERCULOSIS OF THE CONJUNCTIVA, PROBABLY PRIMARY, FOLLOWED BY GENERAL INFECTION AND DEATH."

BY DR. F. E. CHENEY, BOSTON.

The primary lesion appeared on the conjunctival surface of the left upper lid and presented the typical appearances. Tubercle bacilli were found on microscopic examination. The glands in front of the ear were affected when first seen. Frequent examination of the chest failed to elicit any trouble in the lungs. Patient disappeared from the clinic on May 26th, and on July 4th, died of general tuberculosis. The main trouble just preceding her death seemed to be with the throat.

"A CASE OF PECULIAR GROWTH AT THE INNER CANTHUS."

BY DR. A. A. HUBBELL, BUFFALO.

This paper is published in full in these ANNALS.

"DIPHTHERITIC CONJUNCTIVITIS."

BY DR. MYLES STANDISH, BOSTON.

Dr. Standish reported a number of cases of membranous conjunctivitis which had been examined bacteriologically, and it was a peculiar feature that some which presented the clinical picture of diphtheria were free from the characteristic organism

of that disease, and others which appeared to be only croupous in character were found to present the Klebs-Loeffer bacilli. Some cases were due to the staphylococcus or the streptococcus and others were of mixed infection. Dr. Standish thought such examinations would call for a readjustment of our nomenclature, on bacteriologic principles.

"NOTES ON KERATITIS PUNCTATA SUPERFICIALIS."

BY DR. B. ALEX. RANDALL, PHILADELPHIA.

Dr. Randall reported a peculiar and persistent case. "The patient came with a watering, painful eye which had been so since a slight blow received three weeks before. The condition was growing worse and sight was impaired. Only one eye was affected and it showed marked conjunctival and circumcorneal injection. The iris was not at that time affected. The cornea showed superficial infiltration at the outer lower margin. The surface was nowhere abraded, but was marked by nearly uniform pin-point elevations over the whole affected area. These points were not arranged in the usual triangular form, though they resembled those of Descemetitis. The case has not improved under any treatment, and now has an appearance suggestive of coming ulceration. There is no malarial, syphilitic or other taint."

"THREE CASES OF MEMBRANA PUPILLARIS PERSEVERANS, IN WHICH THERE IS A FIRM ATTACHMENT TO THE LENS CAPSULE WITH OPACITY OF THIS MEMBRANE, AND OF A THIN LAYER OF UNDERLYING LENS SUBSTANCE."

BY DR. W. F. NORRIS, PHILADELPHIA.

Of the four cases reported two were situated at the upper outer quadrant, one at the inner and one in the lower outer. In no case did the attachment to the capsule extend as far as the anterior pole of the lens. In two cases the pyramidal bands of persistent pupillary membrane were broad, of the same color of the iris itself—becoming gray only close to their insertion in the capsule, in one they were grayish with a slight tinge of brown pigment, and in one they were thin brownish shreds running to a very faint capsular spot. In two cases the bands were inserted so far in the periphery of the anterior surface of the iris that they in no wise interfered with the contraction and dilatation of the pupil, while in two some of the bands were inserted into the smaller circle of the iris and prevented full dilatation of the pupil at that point. The eyes were all hypermetropic astigmatic, two of them presenting high degrees of

this defect. In one there was an apparently congenital patch of choroiditis. The fundus in the other three presented no abnormalities. The lens was in every instance transparent, except at or near the point of capsular attachment, where there was slight proliferation of the anterior epithelium. The points of attachment apparently corresponded with the position of the tips of the vascular loops which in the foetus ramify in the anterior pupillary membrane."

DISCUSSION.

Dr. F. W. Abbott, of Buffalo, reported a case of persistent membrane in which seven fine shreds, as delicate as silk, extended from a small spot near the anterior pole of the lens to the iris, where they were attached about midway between the edge of the iris and its circumference. The attachments were upon the posterior portion of the iris and occupied perhaps one-third of its circumference.

"RUPTURE OF THE IRIS AT THE PUPILLARY MARGIN AND IN CONTINUITY, FROM CONTUSION OF THE EYEBALL."

BY DR. G. C. HARLAN, PHILADELPHIA.

Dr. Harlan reported eight cases of which six were instances of pupillary rupture and two of radiating ruptures in the continuity of the iris. In all the cases of rupture beyond the sphincter the tear has been across the direction of the radiating fibres, which have caused the wound to open out and form a rounded perforation somewhat like an additional pupil.

"THE USE OF MERCURY IN TRAUMATIC IRIDO-CHOROIDITIS."

BY DR. C. W. KOLLOCK, CHARLESTON.

Dr. Kollock believes in the use of mercurial inunctions in such cases, and reports several to show its beneficial action.

DISCUSSION.

Dr. Myles Standish, of Boston, reported two cases of Sympathetic Ophthalmia which recovered with vision of 1. In both cases the recovery was attributed to the inunctions of mercury.

"A CASE OF DOUBLE CHOKED DISKS, CAUSED BY A CYSTIC TUMOR INVOLVING THE RIGHT FRONTAL LOBE OF THE BRAIN, WITH AUTOPSY."

BY DR. H. F. HANSELL, PHILADELPHIA.

See these ANNALS for complete paper.

"SOME BACTERIOLOGICAL EXPERIMENTS BEARING UPON THE STERILIZATION OF INSTRUMENTS USED IN CATARACT EXTRACTION."

BY S. THEOBALD, BALTIMORE.

After a series of very careful experiments, Dr. Theobald concludes "that bacteria are not removed by simple washing, even from the smooth surface of a cataract knife, but so far as the ordinary pyogenic organisms are concerned, a very brief washing in boiling water, which is not likely to appreciably blunt their cutting edges, suffices to sterilize effectually such instruments as are commonly used in eye surgery."

"EMBOLISM OF THE CENTRAL ARTERY—RETINO-CILIARY ARTERY SUPPLYING THE MACULA—PRESERVATION OF CENTRAL VISION."

BY DR. O. F. WADSWORTH, BOSTON.

"In 1890, I reported a case of plugging of the central artery of the retina in which the macular region was supplied by a retino-ciliary artery and central vision preserved. The case presented to-day offers a striking similarity in its essential features. There was the sudden onset and marked permanent concentric contraction of the field, with retention of good central vision; the white haze involving disk and retina for a long distance but leaving the macular region, the space between it and the disk free; the evidence of disturbed circulation in the retina; the retinal ciliary artery supplying the macular region; but, there were differences in detail. The first case was considered as one of thrombus because no lesion of the heart or great vessels was discovered. In the second a lesion of the aortic valve gave opportunity for the formation of an embolus."

DISCUSSION.

Dr. W. F. Mittendorf, New York, reported three cases of this kind where complete blindness was prevented by the central ciliary artery.

"TWO CASES OF A RARE AND GENERALLY FATAL DISEASE OF DEGENERATION IN INFANCY, ASSOCIATED WITH EARLY BLINDNESS AND THE CHARACTERISTIC RETINAL CHANGES."

BY DR. CARL KOLLER, NEW YORK.

"Only nineteen cases, including these two, have been reported, and in reading the histories of all, one is struck by their uniformity. The children are born of healthy parents with no history of syphilis; most of them, if not all, are Eastern Jews. Up to the third or fifth month of age the children develop well; nothing unusual is noted unless a former case in the same family directs the attention to the ocular symptoms, which in

fact seem to precede the others. Between the third and eighth month, sometimes sooner, a peculiar weakness of the muscles shows itself; the children are unable to hold their heads up, the back is weak, the muscles flabby, the reflexes present. The further development is retrograde, both as to body and mind. They do not learn to walk, present the picture of idiocy, and fall into a condition of marasmus to which they succumb at the age of about two years. The eye symptoms, although not always first noticed, seem to appear in the first weeks or months of the child's life. It is not likely that the retinal changes are congenital, as some observers have said. The ophthalmoscopic picture is of striking uniformity, and according to all observers, very similar to the changes found in embolism of the central artery. The yellow spot region is the site of a whitish opacity, the centre of which shows a cherry red spot. The disks are yellowish or grayish, but otherwise look normal and well defined; later on atrophy develops. In some cases there is nystagmus. The affection is a family disease, the nineteen cases reported having occurred in ten families. So far, only three autopsies have been held. In these changes were found in the layer of large pyramidal cells in the cortex of the brain, which seem to be due to arrested development. One observer found descending degeneration in the cervical part of the cord. No satisfactory examination of the eyes has been made." Dr. Koller then gives in detail his two cases and concludes "that the anatomical substratum of the affection is most likely a degeneration process in the cortex of the brain and in the retina. From the clinical course of the disease, the original healthy condition of the child, the consequent development of the marasmus, and the characteristic changes in the eyes, we must conclude that we have to deal less with a condition of arrested development than with a progressive morbid process in the nervous system."

DISCUSSION.

Dr. Knapp had seen three cases, all in Hebrews. He urged the examination of the macula in every child brought for nerve trouble or defective sight.

"ANGIOID STREAKS IN THE RETINA."

BY DR. G. E. DE SCHWEINITZ, PHILADELPHIA.

Dr. de Schweinitz reports two cases showing the characteristic appearances of these streaks, and remarks that "the interesting point in connection with these sketches is that they

demonstrate, from the ophthalmoscopic standpoint, at least, the undoubted haemorrhagic nature of the lesions, which may be traced from their origin in the haemorrhagic matamorphosis through the stage in which the formed striae, still partly haemorrhagic in nature, are disposed in characteristic and branching lines, to their later development into true pigment streaks and ridges." Dr. de Schweinitz made a careful examination of this patient's blood, and found that the retinal haemorrhages were probably not the result of any general blood dyscrasia.

DISCUSSION.

Dr. Knapp, who gave this name of Angioid Streaks to the condition described, presented some pictures of its characteristic appearances, and said that he had noticed their direct connection with a haemorrhage and had in fact practically observed the gradual development of the streaks while the haemorrhage was undergoing absorption.

"THE MANAGEMENT OF GLAUCOMA."

BY DR. S. O. RICHEY, WASHINGTON.

This paper is published in full in these ANNALS.

SOME REMARKS ON NASAL OBSTRUCTION, WITH
A DESCRIPTION OF A NASO-MANOMETER;
MASOPHARYNGEAL AUSCULTATION.*

BY JONATHAN WRIGHT, M. D.,

OF BROOKLYN.

In the last twenty years volumes have been written, in the aggregate, on the subject of nasal obstruction. It would be very rash, indeed, to attempt to present anything new before this Section on so trite a subject. In laying aside the etiology and treatment, and even the pathology of the condition, and confining myself to a few remarks on the diagnosis of nasal obstruction, I may hope, however, to draw your notice to a part of the subject which has not received the assiduous attention devoted to the other divisions. It would seem, to the inexperienced, that the diagnosis of nasal obstruction was too simple a subject to require much discussion. The statements of the patient, and above all, the inspection of the physician, would seem ample proof of its existence or absence. Now, as a matter of fact, the statements of the patients are in a large proportion of the cases, very misleading. It is not a common thing, even in these rhinological days, to have a patient come to you complaining of nasal obstruction alone. Almost invariably his first complaint is of something else. Usually he says: "Doctor, I have catarrh." That settles the question of pathology, etiology, diagnosis and treatment with him. He can breathe through his nose comfortably, or when you hold one nostril for him he discovers for the first time that one side is a little freer than the other.

The growth of nasal obstruction has been so slow that the patient's sensations of lack of air have appeared those of normal health. We see the same thing occasionally well illustrated in purely tracheal obstruction. Until the passage at the obstruction is narrowed to a fractional part of the normal lumen these pa-

*Read before the Laryngological Section of the New York Academy of Medicine, May 27, 1896.

tients often do not complain of any dyspnoea. On the other hand, we frequently see cases of atrophic rhinitis in which the nasal chambers are enormously increased in size; cases also in which the crusts have been washed away, or are only an insignificant hindrance to the air current, yet these patients complain of nasal obstruction. Frequently, on examining a patient's nose, we are confronted with large nasal chambers, apparently pretty well filled by anfractuositities of the septum and the succulent turbinated bodies, and yet these patients declare that there is no difficulty in breathing.

Very frequently the patient will say that he can breathe better through the nostril which to inspection seems most occluded.

From want of perspective a tortuous nasal channel frequently has the appearance of being obstructed, when it is, in reality, wide enough for respiratory purposes. In order to assist in solving some of these confusing questions, Zwaardemaker (*Archiv. f. Laryngologie* I. 2) described a method of estimating the amount of nasal obstruction by use of cold glass and other material, upon which with expiration, the air from the nose, would deposit films of condensed vapor of unequal size, according to the patency of the nasal chambers. The objections to this are obvious, of course.

It is a test for expiration, and not for inspiration, and the two differ materially in many noses, inspiration being the act which is more directly connected with pathological changes. It must also necessarily be very inaccurate, even for expiration.

Kayser (*Archiv. f. Laryng.* B-d II. Heft. 1 and 2, p. 101) has investigated the subject more carefully, certainly more exhaustively, but has formulated no method for rapid application in clinical work. It occurred to me that a manometer could be made to register the rarefaction of the air in the vestibule of the nose on inspiration, and I constructed the simple apparatus* which you see here, made by Meyrowitz, in a more convenient and workmanlike manner than my rude model. A slender metal tube is connected by a rubber tube with the manometer which is filled with carmin-stained water and fitted to a millimeter scale registering as high as 150. The open end of the metal tube should be placed at the lower border of the vestibule, or just within the margin of the alae, and at a point as nearly as possible in the center of the air way. The patient shuts his mouth and breathes naturally through his nose. On inspiration in normal noses the col-

*I notice in Greville MacDonald's book that he has also used a manometer for the nose. A reference to his "Diseases of the Nose," will show the difference in the construction and application.

umn rises usually from 5 to 15 m. m. on the scale of the manometer. On forced inspiration it will usually rise from 25 to 40 m. m. In some cases of atrophic rhinitis, the current of air on forced inspiration is so strong through the wide chambers, that the column will indicate 75 to 90 mm. of water pressure. When one side of the nose is partially or completely occluded, the unobstructed nostril will show an abnormally high amount of rarefaction of the air on quiet and forced inspiration, and the obstructed nostril a correspondingly low amount of rarefaction. When a patient is not a mouth-breather, and yet has one nostril considerably obstructed, it will be found that the sum of the millimeters indicated by each nostril will approach the sum indicated by the two normal, but equally free nostrils. In other words, the human organism must have a certain amount of air, and if it does not get it through one nostril, it will get it through the other. Now, it must be remembered that there is nothing constant about the figures shown by this instrument except, of course, between wide limits; but as a comparison of one nostril with the other in each case, it is almost absolutely correct, and the amount of obstruction may be estimated at a glance. There are certain sources of error to be avoided:

1. In order to obtain a uniform degree of inspiratory effort on the part of the patient, two or three trials should be made in each nostril with both forced and quiet inspiration.

2. A marked deviation or dislocation of the cartilaginous septum may cause an inequality in the size of the lower aperture of the vestibule. If the nasal chambers proper are equally pervious and the obstruction is at the point where the end of the tube is placed; there will be a higher figure registered by the obstructed nostril. On forced inspiration there may be collapse of the alae, and the condition just mentioned may be established. From this it will be understood that the "naso-manometer" will not estimate the amount of the inspired air when the obstruction is in the lower part of the vestibule. But by the use of a speculum, or by means of a double current glass tip, such as is used in washing out the external auditory meatus, substituted for the metal tube, the vestibule may be dilated so that obstructions posterior to it may be estimated.

3. By too rapidly repeated inspirations the column may be made to jump, and a false figure registered. This, of course, is easily avoided.

4. The observer must make sure that the manometer tubes are unobstructed. A little drop of moisture in the small metal tube may occlude the instrument and prevent it registering.

5. Those desiring to gauge the rarefaction of the air far back in the nasal chambers may do so with this instrument, but they should take care that the end of the tube is not inserted between two moist surfaces in such a way that suction is established on inspiration, as some of the contents of the tube may thus escape into the patient's nose.

A very little experience will enable the observer to avoid all these difficulties. It may be hung against the wall like a thermometer, fastened at both ends, or it may be attached to a proper stand and placed on the table with other instruments. It is hardly necessary to add that it will not differentiate between the kinds of nasal obstruction, but I think it will be found useful to the rhinologist in certain cases, if not in all. For the general practitioner, however, it seems to me that it should be of considerable value, since with it he may diagnose accurately a pathological condition, which he is frequently not able to recognize by rhinoscopy.*

There is another point connected with nasal stenosis that has not been sufficiently studied, and that is the action of the *alae nasi*, governed by the much neglected muscles of the external nose. It has been said that when the late Dr. Oliver Wendell Holmes, in his lectures on anatomy, arrived at this part of his discourse on the muscles, he was accustomed to say: "We now come to the nasal group of facial muscles. I don't believe there are any. We will pass to the next division." It has for a long time seemed to me that rhinologists have acted in the same spirit as the genial autocrat. Even the recent work of Hovorka, on the "External Nose," has almost nothing to say of the influence of these muscles of respiration.

Among the lower races, negroes, and Indians, and in infants, the vestibule of the nose is constantly widely open, and the respiratory muscles are always active.

In moribund and comatose states in patients with fairly thin and high noses, by very little observation it will be seen that paresis of the nasal muscles produces marked nasal stenosis. In practice we not infrequently meet with a condition of apparent paresis of the nasal muscles, in patients who complain of considerable stenosis. These cases I have chiefly seen in private practice. Dilatation with a speculum, or by having the patient pull the ala outward, will usually completely relieve the condition at the time, but I have never been able to relieve them permanently.

*I need not add that the instrument works on the principle of a Sprengel air pump, or what is more familiar to us, on the same principle as a Sass spray tube.

Wearing little wire cages in the nostril, such as devised, I believe, by Dr. Myles, can not usually be kept up for any length of time, on account of the irritation. The amount of nasal obstruction is usually not great, but in nervous patients it is frequently the cause of considerable annoyance. Their complaints are usually so trivial that they would not persist with treatment long enough to be efficacious, but I should think that electricity and massage might remedy the trouble in some cases. This obstruction by the ala must be taken into account in some cases of spurs and deviations of the septum near the columna, especially in the dislocations of the septum. On examination of these patients, where the occlusion is almost or entirely complete, the ala lying against the cartilaginous projection, it would seem that the removal of a considerable portion of the thickened cartilage would give sufficient room for respiration. On two or three occasions I have been very much chagrined after carefully removing a large piece of cartilage to find that I have only taken out the prop, as it were, of a parietic ala, which on inspiration would collapse against the septum, again forming quite as much occlusion as before. Neither is an operation for straightening the septum satisfactory, for where the deviation is entirely within the vestibule, after the operation we have the added difficulty of finding counter support for a splint or plug.

I bring forward this question of obstructing alae in order to elicit remarks from those who may have studied the cases more carefully and more successfully than I.

There are a great many children under 10 years of age, and some over that age, in whom the use of a post-nasal mirror is a matter of considerable difficulty—frequently insurmountable. The examining finger detects the presence of lymphoid tissue, but does not give a great deal of information in regard to the degree of obstruction that the adenoids offer to the air current. The faucial and pharyngeal muscles frequently contract to such an extent that there appears to be much less room than is actually the case.

In children, of course, we expect nothing from their statements. There have been a good many examinations made of school children for post-nasal lymphoid growths. From Wilhelm Meyer to the present time, statistics have been reported as to the frequency of their occurrence. I am not familiar with any statistics, however, or indeed with any statements going to show what proportion of these children give any evidence of post-nasal obstruction. Personally, I see a good many children who give ear

symptoms, or bronchial symptoms, or histories of frequent coryzae, in whom there is no direct evidence of post-nasal obstruction at all. I am familiar with more than one case in which the lymphoid material in the naso-pharynx is very much hypertrophied, filling the vault, and yet giving rise to no appreciable symptoms of any kind.

As to the amount of obstruction these growths offer to the air-current in the naso-pharynx, a great deal of information may be obtained by means of auscultation with the stethoscope, placing the mouth of the instrument firmly against the cheek just anterior to the external auditory meatus.

One gains quite as much information in this manner as in auscultating the respiratory murmurs in the chest, but it requires also quite as much education of the ear, and one needs to verify his examinations at first by the ordinary methods, and by listening to normal pharynges in children and adults. I have not as yet arrived at the proficiency that may doubtless be attained in this method, but am able frequently to diagnosticate post-nasal obstruction in children by no other means. One may note the change in the voice sounds and may hear the "râles" produced by the mucus in the proliferations. I bring forward this aid to diagnosis, with the hope that others may experiment with it and discover, if possible, any value that it may possess.

NASAL PAPILLOMA OR PAPILLARY FIBROMA.

BY EDWARD T. DICKERMAN, M. D.,

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Much confusion has resulted from the publication and description of cases under the title of nasal papilloma, which, under the classification of Virchow¹, are not true papilloma or papillary fibroma.

Hopmann², who first described the condition and reported fourteen cases in one hundred of nasal polypi, and quotes Schaffer³ as finding 20 cases in 182 cases of nasal polypi, leads one to think this is not a rare condition. We also find that he is supported by such men as Morell Mackenzie⁴, Schech⁵, Schaffer⁶, Krause⁷, Chiari⁸ and Jurasz⁹.

On carefully considering these cases we find that all growths with a papillary surface are put in this class, such as adenomata, angeiomata and hypertrophies of the mucous membrane covering the inferior turbinated body—these growths having a very different histological and pathological development from the true papillary fibroma.

The subject was first brought prominently to my notice by the following case: May 2, 1896, John O'Connor, aged 62, presented himself at my clinic, complaining that his right nostril had been occluded for some time. The man was in perfect health and his previous and family history good. He stated that nine years ago his nose had first become occluded, and that he consulted a local surgeon, who had gone blindly into the nose with forceps and curette, and had removed a large amount of "flesh." For about a year he was well, but for the last five years the nose has been closed. On examination I found nothing of importance externally. On looking into the right nostril I found the nose filled to the vestibule with a pinkish gray cauliflower mass. It

was not ulcerated and was movable, apparently having a small pedicle. With a probe I was able to locate its attachment to the upper and anterior portion of the quadrangular cartilage to what appeared to be a slight ecchondrosis. Posteriorly the choana was filled with the same growth, with the one exception that here one or two of the branches appeared oedematous, and protruded through the middle meatus.

The absence of ulceration, infiltration at point of insertion, enlargement of glands and the duration of the disease, compelled the diagnosis of septo-papillary fibroma. With a strong pair of scissors I was able to remove the large portion of the growth with the thickened portion of the septum attached. The remainder was removed with the cold snare and the base cauterized. The hemorrhage was at no time profuse, and at the present time there is no recurrence of growth.

Microscopically, the growth consisted of nine or ten branches growing from a mother base, each about three millimetres in diameter, and from 2 to 4 centimetres long, divided and subdivided towards the periphery, till they had the characteristic cauliflower appearance. Two or three of the branches which extended backward were oedematous, and did not have a distinctly papillary appearance.

Microscopically, as can be fairly well seen by the accompanying photograph, there is a stroma of fibrous tissue, which divides into branches pointing toward the surface. This fibrous tissue is covered by numerous layers of epithelium, columnar and pavement in type. The epithelium is separated from the stroma by a distinct line of demarkation, but with the aid of a high power lens I was unable to make out any basement membrane or parenchyma, such as Virchow describes. The growth must be classed as a true papillary fibroma of Virchow. In his description of papilloma or fibroma papillar, we find that papillae can develop where no pre-existing papillae were present; or can develop from a normal papilla. There are first smaller cellular projections; after these have developed to a certain extent, there appears a vascular loop, which may be covered with connective tissue, or may appear as a vessel covered with epithelium. This development, he says, must be termed a papillary fibroma. This same view is also taken by Klebs¹⁰, Rhindfleisch¹¹, Zarniko¹², Jonathan Wright¹³ and others.

In looking over the literature on the subject, I find that much confusion exists, and that in some cases, no microscopical examination has been made, while in others we find undoubted

cases of papillary adenomata, granulomata, angiomas, sarcomata and hypertrophy of the mucous membrane. These undoubtedly had a papillomatous appearance, but there is much difference between glandular hypertrophy, vascular dilatation and true papillomata. Hopmann's fourteen cases and Schaffer's 20 cases and the accompanying microscopical findings. Butlin¹⁴ reports a case of a girl 13 years of age, from whom he removed from the anterior superior portion of the septum a true papilloma. Moure¹⁵ considers the growth very rare and describes two cases which proved, on microscopical examination, to be granulation tissue and hypertrophied mucous membrane. Noquet¹⁶ reports one case of true papilloma and two that proved to be papillary hypertrophy of mucous membrane of the inferior turbinate body. Michel¹⁷ and Zuckerkandel,¹⁸ each report a



case without microscopical examination. Verneuil¹⁹ has seen one case. Cozzolino²⁰ also one not confirmed by the microscope. McKenzie²¹ says these growths are rare, and generally occur in children on the inner side of the alae nasi. Nuthall²² reports one case of true papilloma; Solis Cohen²³ one case with similar condition in the larynx. Ingals²⁴ describes an interesting case in a man from whom he removed a papillomatous growth from the inferior part of the septum, which recurred during a few months in 25 or 30 different places before the cure was complete. Jarvis²⁵ has seen two cases, but does not consider them true papillomata. Bosworth²⁶ cites one case. Lacoarret²⁷ cites a case springing from the floor of the nose, which had a papillary appearance, but proved to be a myxofibroma. Ruault and Silliet²⁸ demonstrated a case which proved to be a papillary epithelioma. DeSanti,²⁹ in an interesting paper on the

subject, describes a case from which he removed a true papilloma from the anterior superior portion of the septum in a man 84 years old. He also had a rodent ulcer on the nose externally, which had no connection with the papilloma. DeSanti considers the condition very rare. Scanes Spicer³⁰ describes a case of papilloma of the nose and gums, which had existed for five years in a child 12 years old. Dunn³¹ cites a case of a man, aged 30, who had a papillomatous growth on the lower anterior part of the septum, which had existed for five years and eventually dropped off. He is inclined to think that they are more frequent than generally supposed, but disappear in this manner. Bunge³² describes a case which developed on an old case of ozena, and calls it psoriasis nasalis, as it resembles that condition as it occurs in the mouth. Weil³³ reports a case in a woman 67 years of age, in which the growth was attached to the anterior superior portion of the septum, filling nearly the whole of the nasal fossa. Microscopically it proved to be a true papilloma. Baber³⁴ cites a case of a man, aged 36, in whom the growth was attached to the anterior inferior portion of the septum and floor of the nose. Microscopically proved to be true papilloma. Ripault³⁵ reports a case in which the growth was attached to the anterior inferior portion of the septum and the alae nasi, filling the nose. Case of true papilloma. Jonathan Wright,³⁶ in an excellent paper on the subject, discussing it from the standpoint of a rhinologist and pathologist, reports three cases, all of which were true papilloma.

In a careful study of the above cited cases, we find that true papilloma or papillary fibroma is a rare condition in the nose. It generally develops on the anterior portion of the septum, from a small base, is slow in growth, and generally appears in middle life. This is contrary to the views of DeSanti and others, who state that it is found generally in children. The growth does not ulcerate, or cause infiltration at its base; there is an absence of glandular enlargement, and it can be classed as a benign growth in all respects.

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3. Schaffer. Wien. Med. Presse, 1883.
4. Mackenzie. Diseases of the Nose and Throat, Vol. II, p. 377.
5. Schech. Frankh. der Nase, p. 267.
6. Schaffer. Quoted by Hopmann.
7. Krause. Quoted by Hopmann.
8. Chiari. Rev. Mens. de Laryng. No. 3, 1886.
9. Jurasz. Die Krankheiten der Oberen Luftwege, 1890.
10. Klebs. Allgemeine Path.

11. Rindfleisch. Lehrbuch der Path. Gewebe.
12. Zarniko. Krankheiten der Nase.
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17. Michel. Krankheiten der Nase.
18. Zuckerkrandl. Anat. der Nasenhoehle.
19. Vernuelli. Bull. de la Societe de Chirurgie de Paris.
20. Cozzolino. Revista Clinica e Terapeutica.
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22. Mulhall. Trans. American Laryng. Soc., 1889.
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24. Ingals. Trans. American Laryng. Soc., 1889.
25. Jarvis. Trans. American Laryng. Soc., 1889.
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27. Lacoarret. Centralbl. f. Laryng., Vol. XI, p. 16.
28. Ruault and Sillet. Centralbl. f. Laryng., Vol. XI, p. 458.
29. DeSanti. Lancet, Dec. 8, 1894.
30. Scaues Spicer. Centralbl. f. Laryng., Vol. X, p. 64.
31. Dunn. New York Med. Jour., April 8, 1893.
32. Bunguers. Zarniko, Krankheiten der Nase.
33. Weil. Jour. Laryng., Rhin. and Otology, Vol. X, p. 43.
34. Baber. Jour. Laryng., Rhin. and Otology, Vol. X, p. 51.
35. Ripault. Annales des Mal. de l'Oreille, Nov., 1885.
36. Jonathan Wright. New York Med. Jour., Dec. 14, 1895.

SOLUTIONS DOBELL.

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While one eminent rhinologist decries the use of aqueous nasal injections, sprays and cleansing solutions, another equally eminent and learned will stoutly advocate their employment. When doctors thus disagree, who is to decide?

Among the advocates, and as a pioneer, may be mentioned Dr. Horace Dobell, of London, who, about a quarter of a century ago, when at the prime of his professional career, was the author of a work entitled, "Lectures on Winter Cough," which soon became one of the most popular medical works of the then current decade.

In this work was suggested a line of treatment for catarrhal coughs, which in the writer's practice had proven highly beneficial, and prominent among the things advised was the use by injection of an alkaline solution which has ever since been extensively prescribed and used under the name of "Dobell's Solution." In fact, its popularity became so great that its formula was recently incorporated in the National Formulary, though the original proportions were slightly changed.

Several years ago I chanced by accident to observe a marked difference in the strength of two formulæ for this preparation, and this gave me a key to the solution of the *raison d'etre* for the statement made in the opening paragraph. I recently made a brief search through several available medical libraries for vari-

ations of the Dobell Solution formula, with the result of unearthing twenty-one different formulae as given by thirty-one authorities. As a matter of interest, and to call attention to the wide discrepancies to be met with, I will append the result of my investigation in tabular form, and, to allow of easy comparison, I have in each case, when necessary, increased or decreased the quantity ordered to a uniform or common denominator standard of one pint of the finished product and have also disregarded fractions of a grain. As the borax is the most important ingredient I have placed it first and, beginning with the weakest, have then arranged the formulae successively as their strength increased. No. 14 gives Dr. Dobell's original formula, while Nos. 13 and 15 give respectively the metric and troy rendering of same in the National Formulary.

Formulae for Dobell's Solution as given by various authorities:

	Sodae, Bibor.		Sodae, Bicarb.		Acid, Carbolic.		Glycerine.	Water.
1	Grs.	30	Grs.	30	Grs.	15	Drm. 4	Pt. 1
2		32		32		16	8	1
3		32		32		16	16	1
4		32		32		16	21 $\frac{1}{2}$	1
5		40		40		32	8	1
6		60		30		12	16	1
7		60		60		45	8	1
8		60		60		45	..	1
9		71		71		14	14	1
10		78		78		21	4	1
11		96		96		38	2 $\frac{1}{2}$	1
12		96		96		32	5 $\frac{1}{2}$	1
13		116		116		23	4 $\frac{1}{2}$	1
14		120		120		48	3 $\frac{1}{8}$	1
15		120		120		24	4	1
16		120		120		24	8	1
17		120		120		24	..	1
18		127		127		27	6 $\frac{1}{2}$	1
19		240		240		80	14	1
20		240		240		120	14	1
21		480		480		180	29	1

1. Seiler, Diseases of Throat, Phila., 1889, p. 168; Hare, Pract. Therapeut., Phila., 1895, p. 93.

2. R. W. Seiss in Hare's System of Practical Therapeutics, Phila., 1892, Vol. II, p. 417.

3. Ingals, Chest, Throat, etc., N. Y., 1881, p. 402; W. M. Carpenter, Index of Prac., N. Y., 1884, p. 52.
4. Roosa, Diseases of Ear, N. Y., 1885, p. 391.
5. R. W. Seiss in Burnett's Ear, Nose and Throat, Phila., 1893, Vol. I, p. 646.
6. Bosworth, Nose and Throat, N. Y., 1889, Vol. I p. 174.
7. Remington, Prac. of Pharmacy, Phila., 1894, p. 1302.
8. Parrish's Pharmacy, Phila., 1884, p. 1004.
9. Loomis, Practical Medicine, N. Y., 1884, p. 11; Hughes' Practice of Med., Phila., 1894, p. 242; E. J. Bermingham, Pract. Therapeutics, N. Y., 1885, p. 198.
10. MacDonald, Diseases of Nose, London, 1890, p. 351.
11. Ball, Nose and Throat, N. Y., 1895, p. 357.
12. Hall, Nose and Throat, Phila., 1895, pp. 33 and 504.
13. No. 242 N. F. in Proceedings Amer. Pharm. Ass'n, Balt., 1895, p. 90.
14. Horace Dobell, Coughs, Consumption and Diet, Phila., 1877, p. 183; Mackenzie, Esophagus, Nose, etc., N. Y., 1884, p. 380; Lefferts, Pharmacopoeia for Larynx and Nasal Passages, N. Y. 1884, p. 11.
15. No. 235 N. F. in U. S. Dispensatory, 17th. Ed., 1794; Clinton Wagner in Burnett's Ear, Nose and Throat, Phila., 1893, Vol. I, p. 597; Remington, Prac. of Pharm., Phila., 1894, p. 1279; Farquharson, Therapeutics, Phila., 1889, p. 538.
16. Scoville, Art of Compounding, Phila., 1895, p. 75.
17. Shoemaker, Mat. Med., Phila., 1895, p. 98.
18. Hager, Manuel Pharm., Leipzig, 1892, p. 428.
19. Robinson, Nasal Catarrh, N. Y., 1885, p. 76.
20. Sajous, Nose and Throat, Phila., 1889, p. 410; Biddle, Materia Medica, Phila., 1895, p. 78.
21. S. O. Potter, Materia Medica, Phila., 1895, p. 476.

It will be observed that in two cases the glycerine has for some reason been omitted, and that in several cases different formulae are given at different times and places by the same author. The most marked example of this is by Remington, whose very dissimilar formulae (Nos. 7 and 15) are only twenty-three pages apart. While the variation in the quantity of borax and soda called for is remarkable, it is no more so than is the varying quantity of carbolic acid employed. With this acid in order to get a perceptible antiseptic action in a lotion or douche it must be used in a strength of about 1 per cent or say at least one drachm to the pint. In quantities much less than this it can only be regarded as a flavoring agent and a very poor one at

that. For this latter use I have been in the habit of substituting listerine.

Another variation to be observed is in the quantity of glycerine suggested, this ranging from two and one-half to 29 drachms to the pint. While this is not as objectionable as in the case of the other medical agents, I have by experiment become convinced that one ounce or less gives better results than when the one ounce is exceeded. For commercial reasons in part, as will be later explained, I have arrived at six drams as being the best quantity, but this much I do want and have found that without the glycerine the solution is less agreeable and herein lies one of my chief objections to the use of so-called Nasal Tablets.

In my experiments I found the weakest solution given to be the most satisfactory, it containing one drachm of the combined salts to the pint, which I have generally found to be as strong as is agreeable to the nasal mucous membrane. In the employment of nasal douches (indicated only in atrophic conditions) one drachm of salt to the pint of luke-warm water is the strength most advisable. This makes a fluid of about the same specific gravity as the normal blood serum. (Seiler, Phila., 1889, p. 268.) I have found the same rule holds good, though to even a more marked degree, in hypertrophic conditions. The greater strength so often employed will, in part, explain the unsatisfactory results which have so often been met with. While in purely atrophic conditions a large quantity—a pint or more—of an aqueous solution of proper strength and temperature can, in my opinion, under proper restrictions, be safely employed, in the usual or hypertrophic form of nasal trouble, I have found that a small quantity, one drachm or less, simultaneously sniffed in both nostrils, and frequently repeated, gives the best results, and hence my belief that a second reason why some have found such treatment unsatisfactory is because too great a quantity was each time employed, and possibly not at all heated; so, to recapitulate, I have learned that success in using aqueous solutions in hypertrophic conditions, hinges largely upon the method adopted in the same way as is necessary a correct method in the safe use of the nasal douche; that the strength of the solution should not exceed one drachm of salts to the pint; that the quantity each time employed must not exceed one drachm, and, on the line of the utility of the small dose, frequently repeated, it must be sniffed several times daily, preferably from the palm of the hand, thereby becoming sufficiently warmed, as the quantity is so small.

Having decided to employ such solution as has been described, I ran up against a stumbling block of no mean proportions. I allude to the method of American druggists of basing their charge more upon the quantity ordered—the size of the bottle, if you please—than upon the value of the ingredients prescribed. When among the Romans we are advised to do as the Romans do; so I began experimenting, with the object of pleasing all parties concerned, so that the patient could have the medicine ordered at a reasonable expense, and still comply with the popular pharmaceutical requirements. My solution of the problem was to have compounded together the active agents, and let the patient furnish the pint bottle, the water, and make the required dilution. I have found this method, without exception, to be highly satisfactory, and additional advantages have been attained beyond the primary object. In this way my druggist makes up one quart at a time; I am assured of the purity of the component parts, and the invariable uniformity of the medicine the patient receives, as only the best chemicals are used. I will now give the formula and process, and take the privilege of giving the compound a name which seems to be the most fully descriptive:

MIXTURE DOBELL-PYNCHON.

R	Sodæ Bicarb. Merck, C. P.	
	Sodæ Bior. Squibb.....	āā ℥ii
	Listerine	Oss
	Glycerine, C. P.....	Oiss

First mix and triturate the two salts and place same in a one-gallon bottle, adding one-half of the quantity of glycerine; then let stand 24 hours uncorked, with frequent agitations. Next add the remainder of the glycerine and continue agitations for another 24 hours, with bottle uncorked, as before. Lastly, add the listerine and let stand 24 hours longer, when it is ready for use. By the admixture of the glycerine with the salts, a "foaming" is produced, which means a liberation of carbonic acid gas, and the production of a glycerole. In its use, it is designed that each ounce of this mixture shall be diluted with water to one pint, which will then contain 30 grains each of borax and soda; Listerine, two drachms, and glycerine, six drachms, making a bland and pleasant solution, with a specific gravity of 1015°. For office use it is my standard alkaline spray, though for use as a spray, I am particular to dilute with distilled water.

It is not expected that the small amount of listerine added will give any particular degree of antiseptic property. It is used principally as a flavor, and to increase the quantity above the six drachms of glycerine to one ounce. Listerine is the best flavor-

ing agent I can find, and it is a handsome tribute to its valuable aromatic and pungent properties, when so small a quantity as two drachms will, to an appreciable degree, flavor one pint.

In writing the prescription for the patient, instead of taking the time and trouble to write out the entire formula, I simply order the mixture by name, thus saving for myself much time. The patient, likewise, is a saver of time, as it takes but a moment or two for the druggist to fill the prescription; while if extemporaneously prepared, an half hour or more would be required. I write as follows:

R Mxt. D-P ℥i
S.—Add to aqua Oi, then sniff ℥i
every hour.

I am careful to give patients directions as to its use, as follows: "While standing, pour not to exceed one teaspoonful of the "dilution in the palm of the hand. Next, hold hand about two "feet above floor, and stoop until medicine can be sniffed in both "nostrils at the same time. After this, use handkerchief, but blow "very gently."

After the use of the nasal solution, I direct them to gargle the throat, generally with a weak solution of the chlorate of potash, and to thus repeat the solution and gargle every hour. I prescribe this as a routine treatment for home use, the patient meantime being made to understand that this gives only temporary relief while being used, and that its object is chiefly to prepare the nasal passages for the surgical steps which must follow from time to time, and upon which the only hope for cure can be placed. During the entire course of treatment the patient is directed to continue the sniffing and gargling every hour or two, which, by the way, is equally as effective in controlling inflammation after operations, as in preparing the passages at first. By stooping well forward and sniffing as directed, the solution enters all three of the meatuses and thus has a beneficial effect upon the entire Schneiderian membrane, while, owing to the small quantity each time employed, there is no danger of its entering the eustachian tubes. In a large experience for the past seven years, in both clinical and private practice, with this method of treatment I have invariably met with favorable results, but I insist upon the exact following of directions. I greatly prefer the sniffing as described, to the use of an atomizer, and reserve this instrument exclusively for medicated alboline sprays.

The advantage of stooping has been emphasized by T. F. Rumbold,* of St. Louis, he having recommended the use of a solution of common salt, one drachm to the pint of warm water, of which "one to three handfuls" were to be sniffed several times a day. I can easily appreciate a danger in using so large a quantity, and my experience with salt in hypertrophic conditions, has not been favorable.

Other great advantages in the concentration for patients who are travelling, are its compactness and portability, and the fact that as small a quantity as is desired can be prepared; for example, half a drachm of the mixture to one ounce of water.

While in hypertrophic conditions the intention is to add one ounce of the mixture to a pint of water, in some cases, when beginning treatment, owing to hypersensitiveness, I direct a still greater dilution to a point of perfect tolerance. In atrophic forms of nasal trouble, or if ozena be present, I add to the mixture a proper amount of carbolic acid, and sometimes, for a short time, to secure greater stimulation, increase the strength by adding more than one ounce of the mixture to the pint of water. For example:

R Phenol.....℥ss
Mxt. D-P.....ad ℥ii
M.
S.—Add to aqua Ol and sniff
℥i-℥ii every hour.

In the atrophic form more than one drachm may be safely advised. After a very short time, the phenol can be dispensed with, and the strength reduced to the usual amount of one ounce to the pint.

The practicability and convenience of this mixture will appeal to the country practitioner or to the physician to whom a drug store is not conveniently near.

Having on hand a mixture so valuable as this, it is not at all strange that I should have discovered other methods for its employment, and no doubt the list could be easily extended.

In the treatment of hardened cerumen, I have found it admirable as a softening agent. Directions are given that 15 or 20 minims be dropped in the auditory canal at night, and then the meatus plugged with cotton made dense with mutton tallow, or what is still more elegant, when obtainable, Hageman's camphor ice. This is repeated for three or four nights in succession, after which the cerumen is easily dislodged by a warm water injection.

*Hygienic and Sanative Measures for Chronic Catarrhal Inflammation of the Nose, Throat and Ears, St. Louis, 1880, Vol. I, pp. 68-76.

Another use to which I have put this mixture is as a lotion for chapped hands. At night, after a thorough soap and hot water washing, a teaspoonful is applied to the hands and well rubbed in, following which an old pair of kid gloves are worn till morning. After two or three nights the trouble will be corrected as well as, or better, than when any of the popularly advertised chapped hand lotions are employed.

Diluted in the proportion of about two ounces to the pint of water, it will be found to be an efficient and agreeable gargle; sometimes better hot than cold.

Columbus Memorial Building.

HETEROPHORIA FROM NASAL REFLEXES.

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In 1876, Dr. Stevens read before the Academy of Medicine, New York, a treatise on graduated tenotomies, for muscular insufficiency, and since, through his energetic and persistent advocacy, and the hearty co-operation of some others, it has become at last, deservedly, recognized as an operation.

It is not, therefore, my intention to belittle an operation, which, notwithstanding the negligence, and I may say, ridicule, of many, has proved of definite value in ophthalmic surgery, in a large number of cases.

My experience, during the past few years, has taught me to operate with discretion, and I think it the duty of the older members of the profession, who have repeatedly performed the operation, and met with frequent failures, to advise all young operators, who are becoming so numerous, both in town and hamlet, to delay operating until other means have been tried. Systematic muscular exercise should be used, the general health be looked after, as well as the condition of the nasal cavity. These suggestions have been called forth by several cases, which I have seen, in the past year, where repeated operations have rather tended to aggravate, than relieve.

The object of this article is to call attention to the fact that muscular anomalies are often induced by enlarged turbinates. This, of course, is well known, but, I think, too little considered.

A few cases, taken at random from my records, will show the improvement in the ocular muscles, following treatment of the nose.

Case 1. In 1891, Mrs. E., 27 years, of good physique, always healthy, consulted me for severe headaches, from which she had suffered during the previous two years. For this time she had been treated by different competent oculists, a gynaecologist, and a nervous specialist, with only temporary relief. She had been told no relief would be obtained until the ocular muscles had been cut.

My examination showed hypermetropic astigmatism, a small amount; exophoria, 14 degrees, hyperphoria, 9 degrees.

She was then wearing the full correction of the refractive error, with a prism of 3 degrees, before each eye, base in.

This glass, although it allowed her to read more easily, did not relieve her headaches. These were usually nocturnal, coming on about 3 a. m., and lasting until an hour after breakfast; they, however, sometimes continued day and night, without intermission.

I saw this patient several times, and found variations in the muscular tension. I advised operation, but before resorting to it, referred the case to Dr. E. D. Spear, for examination of the nasal cavity.

He found greatly enlarged middle turbinates, firmly impacted against the septum, and, under his treatment, the patient's headaches were relieved.

I again examined the patient, six weeks later, and found that she had discarded her glasses. Hyperphoria was reduced to 3 degrees, and exophoria to 5 degrees. This induced no discomfort, and she was satisfied to let well enough alone.

Case 2. Mr. C., 34 years, civil engineer; had been suffering from severe headaches since 1893, following an attack of la grippe, always had perfect health; headache, usually at midnight, relieved in the morning, and again appears at evening.

During the past two years has been operated on seven times, converting an esophoria into an exophoria of 5 degrees. Has been advised to have an operation on the externi, and, with this object, comes to me.

I advised nasal treatment, and he receives permanent relief, although the exophoria has increased to 9 degrees. Prescribed prisms, two and one-half degrees, base in, for reading, and he has had no further trouble.

Case 3. Miss L., instructress in sewing in the public schools, 27 years of age, last year suffered from headaches, and inability to use her eyes. Has been operated on for esophoria.

Examination; slight amount of astigmatism, five degrees of esophoria still present. As her headaches are nocturnal, advised her to have her nose examined, and enlarged turbinates were found. After being treated for two weeks, she was relieved of all her abnormal symptoms.

Case 4. Miss L., 34 years, milliner, complains of neuralgic pains in her left eye, extending backwards to the occiput. Duration of trouble, one year.

Vision, left eye, normal; right eye, one-tenth. Has always been amblyopic in the right, which, she thinks, was crossed, when a child. The left eye has been operated on, within the

past two months, which has rather aggravated her symptoms. Examination of the nose reveals sensitive and hypertrophied middle turbinate. Was advised to have treatment, and received immediate benefit, so that she returns to her work, which she has been unable to do for a year.

These few cases, from my records, could be multiplied, indefinitely. There are certain peculiarities manifested in these hypertrophied, or engorged turbinates; the pupils, as a rule, are dilated, reacting promptly to light, but again dilating, although a bright reflected light is thrown into the pupil. There seems to be a paresis of the third, or an over stimulated sympathetic, so that examination with, or without atropia, shows but a small amount of latent accommodation, and where a patient has used a plus 1.50D. after treatment, is unable with comfort to overcome a.50D.

The enlarged turbinate, that seems to induce the most discomfort, is the middle one, and contact with the septum, however slight, is sufficient to produce annoying, and sometimes, severe pain.

OTITIS MEDIA CATARRHALIS CHRONICA.*

WITH A REPORT OF A NEW INSTRUMENT FACILITATING THE TREATMENT.

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We are all familiar with the etiology, pathological changes and general appearance of the membrana tympani, etc., in this disease. The chief points of interest are its frequency, its insidiousness, its progressiveness, its destructiveness, and its obstinacy to treatment. It is to the last of these that I invite your attention. In the majority of cases this disorder is dependent primarily on some naso-pharyngeal affection, or malformation, which causes, first, a congestion followed by hyperplastic and hypertrophic changes in the eustachian tube, causing its occlusion and thereby, according to most authors, interfering with the proper ventilation of the tympanic cavity; the residual air in said cavity is absorbed through the agency of the blood, creating a vacuum, and the drum head is pressed inward by the external atmospheric pressure. Permit me to quote a former article on this subject, in which the following question arises:

Is the atmospheric pressure sufficient to depress the handle of the malleus, considering the natural opposing forces to be normal?

There is another factor in the retraction of the drum-head to which there is generally but little importance attached, and that

*Read before the American Laryngological, Rhinological and Otological Society, New York, April 18, 1896.

is the intra-tympanic muscles. The retracted membrana tympani, during the first attack of naso-pharyngitis, with its contingent hyperemia of the eustachian tube and its temporary occlusion, must resume its normal position as soon as the eustachian tube again becomes patulous, which occurs in a very few days.

That there is no extensive inflammation of the tympanic cavity or membrane, or no exudate or proliferation of the drum tissues, at this time, and that the drumhead does not remain retracted, is self-evident from the fact that the hearing resumes its normal acuity. It is only after repeated attacks of "cold in the head" that the patient finally imagines that he cannot hear as well as formerly. Possibly six months or a year later he consults an aurist.

The atmospheric pressure alone is not sufficient, or rather has not existed long enough, to account for the membrane's final retracted and sclerosed condition in these cases. I do not think that the tympanic cavity is ever entirely devoid of air, except in the comparatively rare cases of complete stenosis of the eustachian tube. That we do not have the drumhead undergoing these sclerotic changes in its normal position is more than probably due to the early disorganization of the stapedius muscle, which permits the uncontrolled action of the tensor tympani to hold the drumhead in this retracted position until at length further inflammation and infiltration firmly fix it. The anatomical relation of the stapedius shows this to be possible. It lies in the canal which is found in the substance of the pars petrosa, internal to the descending part of the fallopian canal, and opening into the tympanum by the narrow aperture on the eminentia pyramidalis. It is about seven millimetres long, quite filling the canal, having no connective tissue adnexa (Gruber), as has the tensor tympani; and sends its delicate tendon into the tympanum through the aperture in the eminentia pyramidalis, to be inserted into the head of the stapes, and, according to Rudinger, into the lower extremity of the descending process of the incus. The chief action of the muscle is to raise the anterior part of the foot of the stapes out of the fenestra ovalis (Gruber). This action is directly opposite to that of the tensor tympani which pushes the stapes into the oval window. It is the more delicate of the two, and the fact of its completely filling the bony canal and being devoid of a sheath or connective tissue covering, which is unusual, is conducive to its early disorganization. The stapedius muscle being in direct touch with the periosteum, any inflammation of this canal would partake of the nature of periostitis,

which, interfering with its nutrition, would naturally result in the speedy disorganization of the muscle, this result being hastened by the pressure incident to the periostitis. With the destruction of this muscle the equilibrium between it and the tensor tympani is lost, the membrane is retracted, and the stapes pushed into the foramen ovale. The tensor tympani, though exposed to the same inflammatory process, is differently affected. Being covered with a sheath of connective tissue, it is not so liable to suffer from the pressure. The inflammation assumes the character of a cellulitis, and the vitality of the muscle escapes the deleterious influence to which the stapedius is subjected. The tensor tympani muscle arises from the cartilaginous portion of the eustachian tube, and from a portion of the greater wing of the sphenoid bone. It increases in size as it passes through the upper compartment of the *canale musculotubarii*, since it receives some fasciculi which arise from the septum of the canal. Its tendon passes around the rostrum cochleare, in order to reach the outer wall of the tympanum, where it is inserted into the inner edge and anterior surface of the handle of the malleus. Helmholtz describes the action of the tensor tympani as follows: It first of all, draws the handle of the malleus and the tympanic membrane inwards, but at the same time by its contraction it acts on the axis ligament, which it draws inwards and puts on the stretch; thereby the head of the malleus is further removed from the incudo-tympanal articulation, and the accessory ligaments of the incus, not only toward the hammer but also at the apex of its short process, are stretched, the latter even lifted from the bone. In doing so the incus comes into a position where the interlocking teeth of the articulation between it and the malleus, grip each other most firmly (Gruber). Finally, its long process is obliged to take part in the inward movement of the handle of the malleus and thus press the stapes toward the fenestra ovalis. Considering that this retraction of the drum membrane exists, while the eustachian tube is patulous, before noted sclerotic changes, or adhesions to bind it down have taken place, is evidence that atmospheric pressure is a factor of little import. If this be so, no other condition could produce it, but overaction of the tensor tympani, from the loss, of its opposing forces through the disorganization of the stapedius muscle. In a condition of this kind, politzerization is not only not beneficial, but contra-indicated, as any effective massage would only strengthen the offending muscle, and increase its action. This statement is in keeping with the results of politzerization,

which I venture to say, if tabulated, would not show two per cent. of cures. In the later stages, where the drum-head is retracted and sclerosed, with stiffened or ankylosed ossicles, politzerization is too feeble for massage, and is practically useless in ear affections, except for intra-tympanic injections, or as an aid in diagnosis. The benefit to the patient is purely psychical. Its popularity is probably due more to the impression made on the patient, than to the results of the inflation, as it has no other advantage over the Valsalvan method, which is unobjectionable in an instructed patient. The objection to this method of inducing an increased blood supply to an already hyperaemic organ, does not hold good in instructed patients, as both tubes can be inflated in an instant if the patient is made acquainted with the result to be expected from the maneuver.

The principle of paramount importance in the whole technique, of the present treatment of this disease, is inflation and massage, and the question that presents itself is: Is this refractoriness to treatment due to the intractibility of the disease or to some defect in the method employed? I am inclined to think it is the latter. Admitting, as we must, that extensive pathological changes exist as a sequence of this disease, that we have proliferation of the drum tissue, that we have ligamentous adhesions in the tympanic cavity, that we have an hypertrophied eustachian tube, and ankylosed ossicles, whether they be primarily or secondarily dependent upon the disorganization of the stapedius muscle or not; they are *prima facie* evidence of effect and not of cause, and politzerization and massage are nothing but symptomatic treatment.

Symptomatology is important in continued fevers, and symptomatic treatment is permissible in these cases, but we have no more right to expect results in this disease when we confine our treatment to the effects or the pathological results, than we should expect to cure anasarca by tapping the leg, instead of toning up the heart or kidneys.

Post syphilitic cicatrices on the arm, or any portion of the body, do not interfere with a person's general condition, but post syphilitic cicatrices of the brain, the results of gummata, which have healed under specific treatment, leave the patient with some semblance of paralysis; the function of the brain at that point is destroyed, in fact, there ceases to be brain tissue at this point. It is replaced by adhesions and connective tissue, and the patient remains permanently disabled, the damage being irreparable. In the same manner, if the cicatrices on the

body are harmless, they are not so in the organs of the special senses; the changes in the tympanum due to otitis media catarrhalis chronica are nothing more nor less than cicatricial changes, ligamentous adhesions, proliferation of the tissue of the membrana tympani, ankylosis, etc.; they are cicatrices, and are no more curable in this site than elsewhere.

Massage will not remove scar-tissue any where, and, while it is beneficial in muscular inertia, caused by non-usage, or fractures, and in some forms of ankylosis, to my mind it is not only not beneficial in this disease, but contra-indicated; as its influence not only accelerates the action of the offending tensor tympani muscle, but causes disturbance of the intra-labyrinthal fluids, thereby interfering with normal sound conduction, all of which is detrimental instead of beneficial. In many of these cases we have a very brief cessation of the tinnitus under this treatment, but I ask you if it is scientific, or even politic, to relieve the tinnitus caused by organic changes, at the expense of more complicated organs that are in a normal state.

The fundamental idea of the whole science of medicine is, remove the cause; and this disease is no exception. This can only be accomplished by treating the naso-pharynx, and by intra-tympanic injections; the former by removing obstructions and by topical applications, the latter by applications to the eustachian tube and tympanic cavity by some available method. The eustachian catheter acting as a director, about a half a drachm of some solution is forced through it by an air bag into the tympanic cavity. How much of it goes into the tympanic cavity, it is hard to say.

I have been using camphor and menthol, five grains to the ounce of benzoinol. At the time of its expulsion through the tube, there is a fine spray forced out of the nose and mouth, indicating that a large portion, on account of resistance, is reduced to a spray and does not enter. To obviate this I had Tiemann, of New York, make me a eustachian canula, much on the same principle as the uterine irrigator (see cut), so as to give a return current of air, facilitating the entrance of the compound into the tympanic cavity, while the excess is blown out through the exit-tube. I have been using it about five months, and find it very satisfactory. I have been using pure oxygen gas, under pressure, with this instrument on the principle of rarefying the air in the cavity, but as yet have found no advantage in it over ordinary air. I had hoped to have a case of serous effusion into the tympanic cavity to see if this could not be re-

moved by the canula instead of requiring a paracentesis. It certainly ought to accomplish it. The continuous pumping of air into the tympanic cavity would naturally displace the effusion through the return canula of the tube. It has all the advantages of the eustachian catheter with the additional one of a separate exit canal, thus permitting a continuous vapor current over the diseased area, which is impossible with the older instrument. An enclosed cavity once filled, nothing else can enter, whether it be air or a solution, the latter being dissipated into fine spray by the resistance of the inflated cavity. The benefits of the applications made with the eustachian catheter are



Author's Eustachian Canula.

therefore confined altogether to the eustachian canal, instead of reaching the cavity for which they were intended. With the canula devised by me, the resistance is done away with, and the entrance of the compound facilitated.

The canula is made of silver, of the same size as the ordinary eustachian catheter, and can be bent as desired without interfering with the lumen. It is manufactured by Geo. Tiemann & Co., Park Row, New York.

Westinghouse Building.

THE PUSTULO-CRUSTACEOUS SYPHILIDE OF THE END OF THE NOSE.

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Syphilis is without doubt the most protean affection whose manifestations are daily seen by the medical man, and unfortunately for those who suffer therefrom, it is also one whose symptoms are more often misinterpreted and misunderstood than any other one. The syphilologist has been often accused of seeing syphilis everywhere and in every one, and yet, it does exist to such a degree that he cannot shut his eyes to the writing on the wall, nor can he very well pervert facts in order to protect the standing, age, or social position of the hapless victim who has been so unfortunate as to be attacked by what a rather cynical French writer was pleased to term the "cosmopolitan" disease. We are daily confronted with the various manifestations in hospital, clinic, and private practice, and the examples are certainly numerous in which a failure to appreciate the true cause of the symptoms observed, has but too frequently led to a lethal termination, when an examination at a sufficiently early period by a competent physician would have prevented such a disastrous ending of a perfectly curable trouble. A more profound appreciation of these facts has been gradually approaching, due in great part to the successes obtained by those who were capable of recognizing the true state of affairs, and also due to the greater stress which is being daily laid upon a more thorough teaching of syphilology, and a greater attention to the relations of a pathogenic character which syphilis bears to morbid processes, by writers of worth and repute. As is well known, there is no tissue or organ which syphilis does not attack, and it has the inconvenient property of being a close simulator of all other diseases, so that, in many instances not only

is it necessary to employ a great deal of acumen, but a rather large and comprehensive experience is necessary in order to fully comprehend an obscure or puzzling case. Another thing as requisite, is the power of retaining the different appearances of various lesions and the peculiar localizations of some forms of them. These two latter indices are of the greatest value in some cases, more especially from the fact that the distribution of lesions is very irregular as well as inconstant in syphilis.

It is a mistaken idea that it is the city physician only, who should be acquainted with syphilis and its many symptoms and their appearances. The country practitioner sees many cases, but, through lack of training or experience, he does not recognize them. Another fallacy which has existed for a long time, was that the specialist in all other lines but syphilology did not require more than a very superficial knowledge of the subject. These ideas are fast disappearing, and with them there is coming a more rational appreciation of the conditions presented, better treatment of patients, and a larger amount of confidence in the laity. The desire of the latter to deceive or lead astray the physician is becoming less, and the attempts made meet with less and less success on account of the greater diagnostic acumen, which is becoming more and more disseminated among medical men. It is not the purpose of the present few notes to endeavor to aggrandize one of the branches of medicine, but rather to throw out a hint which may possibly be of use to some who have hesitated in doubtful cases. The physician, like the woman, who hesitates, is lost. He begins floundering, and should apply for help directly he knows his weakness. He will thereby avoid the mortification of a confession in *forma pauperis* and, at the same time, spare his patient much time, suffering, and possibly disfigurement or loss of function of a permanent character. There are certainly objects to an honest practitioner; and even to him seeking worldly advancement, the successful termination of a case is always much more preferable to a disastrous or incomplete result. In order to obtain an adequate knowledge of cases, there is no doubt whatever that the observation of a large number under the teachings of one competent to properly demonstrate them is the best; but, such opportunities failing, the next best thing is, beyond all doubt, the careful study of reports and illustrations of cases which are typical, and the variants occurring in any general class. This has been partially the object of the writer in making a few notes on a particular local form of a

syphilide, and a few illustrations have been appended for the purpose of rendering the text somewhat clearer, as well as for enabling the reader to form a clearer conception of the subject in hand.

To the physiognomist the nose is the most prominent feature of the human countenance. It gives expression to the features and may make or mar a face. An observer is immediately struck by its appearance, and its importance in this respect may be surmised when we bear in mind that it is more frequently lampooned and caricatured than any other feature of the face. In the estimation of the physiologist, the nose is a most useful organ. It subserves a most useful function in that it brings the inspired air to the proper temperature and filters it for its proper reception into the lungs. It also subserves other purposes to which we will not allude in this place. To the rhinologist, very naturally, the nose is a most important organ, and one susceptible to quite a large number of affections of varying character and of all degrees of severity from a simple acute catarrh to destructive epithelioma or rhinoscleroma. To the syphilologist it is interesting as it is the seat of some of the most important lesions which are observed in the disease, as well as some of the most unusual and infrequent. The very fact of its prominence, and of its complicated structure, renders the nose one easily observed, more especially when affected by syphilis, and more so when its external surface is the seat of any lesion. Its lining mucous membrane is frequently affected in conjunction with an external luetic trouble, more often in fact than when the Schneiderian membrane is first attacked. In the latter instance, one is more apt to observe an affection of the bones supervening, than an implication of the external integument. It is the most early manifestation seen in prenatal syphilis, and when present it always arouses suspicion in regard to the possible presence of syphilis in infants.

In the following, the writer proposes to call attention to one particular syphilide of the nose, and only to one of its manifestations so far as localization is concerned. It is the pustulo-crustaceous syphilide of the end of the nose as it occurs in both acquired and prenatal syphilis. It is an unusual form, and apt to lead to error on account of its resemblance to other diseases. When confined to the end of the nose, the error is more apt to occur than when some additional lesions are disseminated over the face. Whilst the pustulo-crustaceous syphilide is often seen upon the face or the body and limbs, it is quite unusual to see

it confined to the end of the nose. However, before going into a consideration of this particular form of syphilitic eruption of the nose, it may not be inopportune to describe and give the histories of a few cases which I have observed within a comparatively recent time. Briefly stated, they are as follows:

Case 1. Florence H., white, aged 30, a seamstress by occupation, single; has been in the Female Hospital several times. Her family history is good. Her father was killed in a railway accident; her mother died of typhoid fever. There is no history of phthisis in the family.

History.—Patient has been pregnant once and had one child. Her present trouble began ten years ago, when the chancre first appeared. She had a pustular eruption, and in a short time large ulcers appeared upon the leg, arm and back. Although appearing well-nourished, her appetite was poor and sleep broken and irregular. Her bowels were regular. She suffered considerably from headache and osteo-copic pains, besides pain in the ulcers. Treatment caused the symptoms to disappear. Before a thorough course had been given she left the hospital, and has returned on one or two occasions, on account of relapses.

Status Presens.—A marked pustulo-crustaceous eruption exists. Three considerable ulcers exist, one on the anterior part of the left thigh, one on the right arm below the elbow, and one on the back. The heart and lungs are normal, as they always have been. Vaginal examination does not show anything deranged, appearance being normal and secretion correct in quality and quantity. The kidneys are also normal. The urine is pale straw in color, sp. gr. 1.021, and contains neither sugar nor albumen.

The treatment consisted in the administration of protoiodide of mercury gr. 1-6 three times daily, and increasing the dose gradually. In addition, iodide of potassium in twenty-grain doses was given three times a day, and the dose was increased five grains daily. Locally hot douches and antiseptic dressings (solution of bichloride of mercury 1 to 1000) were used.

The patient is now fast nearing that period of syphilis ordinarily known as the tertiary and involvements of the deeper tissues may be expected, more especially as she is not persistent in following out a thorough course. As soon as the external lesions appear to be healed she leaves, and naturally a relapse occurs. She does not appear to be addicted to drinking. Scars have always followed the lesions.

In order to understand better and more clearly the nasal involvement, and for the purpose of rendering more clear the remarks which will follow the recital of cases which is to be given, the following details will be found useful.

The eruption consists of pustulo-crustaceous lesions existing upon the nose and other portions of the face, as shown in Figure 1. The eruption is well marked upon the forehead, left side of chin and nose. Whilst more distinctly pustular in the last locality, in the others the crusts are sufficiently well formed to clearly demonstrate the nature of the affection. The forehead is not attacked alone, but the crusts have also invaded the scalp. Upon close observation it will be noted that scars exist upon the forehead—remains of a former pustular eruption. Other scars also exist upon the cheeks, as further evidence of a prior pustular syphilide. The nose has its entire end attacked by the eruption which extends from a short distance below the root down to, and inclusive of, a small portion of the septum. The

crusts are very thick over all, with the exception of the very tip, and here the crusts were lighter in character. A close scrutiny of the picture will show this, although it is much clearer in the photograph, from which it was made. The cause of the crusts being less thick was the fact that scars already existed and, as a consequence, the pustules could not develop as well as they would have upon an untouched integument. This is a point which should never be forgotten, as it may save many an error of judgment in regard to the thickness of crust which is to be expected in a given case. Besides, the crusts, whilst often rather thick, never attain the same dimensions in this respect that are found in rupia. In the case figured, well-marked scars followed recovery from this attack, and no new one has manifested itself.

Case 2.—Charles S., white, a teamster, aged 34, single, entered the City Hospital Feb. 5, 1894. His family history is good, none of the other members having ever suffered from any serious illness. His



Fig. 1. Illustrative of Case 1. (Acquired Syphilis.)

parents attained a good age, and his brothers and sisters are living and apparently in good health.

The patient himself had typhoid fever when nineteen years of age, but otherwise he has always been very healthy. His habits latterly have been none of the best. He has frequently indulged in alcoholic excesses, and his hygienic surroundings have been poor. He has been very careless and inclined to be shiftless, his morale being completely broken down.

About four weeks previous to his admission he was exposed to the weather, which was cold. Shortly after, pain manifested itself in the shoulders and, later on, down the back, into the hips and legs. He had fever, chills, and general malaise. When admitted he had general pains throughout the body and limbs, rheumatic in character; otherwise he felt well and healthy.

Upon physical examination he shows a well-defined cicatrix of a chancre upon the prepuce. The patient gives a clear history of a syphilitic infection, which he states occurred six months ago. He

also states that no secondary symptoms appeared. The chancrous scar presents a fairly well-marked induration, and the inguinal glands are indurated on both sides. No visceral lesions can be determined upon careful examination.

The treatment consisted of bichloride of mercury, iodide of potassium and quinine internally.

Feb. 16. No apparent change has manifested itself as yet.

March 10. Two weeks ago and five days after being vaccinated, the patient developed an eruption over the face and neck. This eruption commenced in the form of large vesicles, which became surrounded by a red areola. This latter also became filled with serum. This was also surrounded, in turn, by a red areola, while the central portion dried up. In this manner large crusts were produced and they were surrounded by a vesicular ring. In addition to the lesions on the face and neck there was one on either arm, near the wrist.

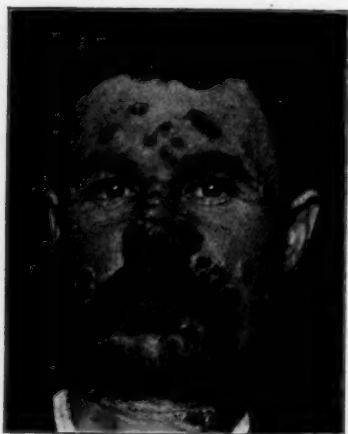


Fig. 2. Illustrative of Case 2. (Acquired Syphilis.)

Under an active treatment the patient made a good recovery, but each lesion was followed by a well-defined scar.

A close inspection of Figure 2 will demonstrate some interesting points in addition to the distribution of the lesions. The forehead is the seat of a certain number of comparatively large crusts which, however, were not very thick, resembling very much an ecthymatous eruption. On the left side of the chin a lesion appears, as also one on the neck, situated to the left. On each side on the temple a little posterior to the external canthus of the eye there is a well-pronounced lesion. On each cheek, just above the moustache, lesions may also be seen, there being more on the left than on the right side. The nose, however, is the part which presents a distribution of more particular interest to us. Upon the bridge of the nose there exists a row of single crusts, which extend down as far as a line drawn from the upper part of the sulcus of each ala nasi. From this point, the entire end of the nose is involved, including the ala. The crusts appear to be smaller, but more closely aggregated, and so closely placed

to one another as to practically form but one. Upon slightly raising this a rather thin pus slowly exudes. The entire picture presented is one which may be regarded as typical. The crusts are rather thick at the end of the nose in contrast with the others. The lesions of the cheeks and that of the neck illustrate very well the ring of serum surrounding the crusts to which allusion is made in the history of the case. The same peculiarity is to be noted in the other lesions, but not quite so distinctly. It was this peculiar formation containing serum which raised doubts in regard to the true nature of the trouble; but there is no doubt that it owed its origin to the influence of the vaccine which had been used to vaccinate the patient.

Case 3. Effie G., white, aged 14, occupation, nil; has always lived in the country and appears of a rather robust build, although easily fatigued by any physical exertion. She has never menstruated and does not show mental development commensurate with her age. No definite family history can be obtained. The parents are not healthy, but not being able to see them nothing of value can be learned. The brothers and sisters are healthy so far as can be ascertained. A cousin, about twelve years old, is being treated for prenatal syphilis in my clinic at the present time.

The beginning of the present trouble cannot be definitely ascertained. Patient had "snuffles" when very young, and was treated for catarrh with no success.

The nose was always more or less stopped up and breathing was largely by the mouth, as it is at present. About six months before presenting herself (March 17, 1896), a lesion showed itself on the upper lip, just below the left ala nasi. It was, no doubt, a pustule, as it was described as a small "boil." This burst open in due time, leaving a superficial ulcer with serrated edges. About this time the lesion spread, involving the whole end of the nose. At present there is a papulo-pustular eruption involving the original site and the left half of the upper lip. A lesion has appeared on the left malar eminence and another one on the bridge of the nose. No eruption has shown itself anywhere else on the body. The nostrils are completely closed by crusts which seem to extend far back and high up. On the left side the nasal bone is apparently involved, being prominent and tender on pressure. No examination is possible, but it is possibly necrotic.

Adenitis of the posterior and anterior cervical glands, of the sublingual and submaxillary glands, is well marked, the induration being classical. The teeth are fairly good. The upper lip is thick and somewhat tilted up. The eyes show the evidence of former blepharitis and the lower lids still give evidence of some conjunctivitis. The cornea are clear.

The patient was placed upon hydrargyrum cum creta, gr. i, three times a day and locally mercurial ointment. The nostrils were swabbed daily with an oil containing oleate of mercury. April 8, the nostrils were partly cleared of crusts and patient began breathing by the nose. The crust on the nose was removed in great part, leaving a granulating surface which bled easily. April 15, a fourth grain of protoiodide of mercury was given three times a day, the local treatment remaining the same. May 8, the process seemed to be in statu quo so far as the lesion of the nose was concerned. Nitric acid was lightly applied and improvement showed itself. May 15, patient left for home, but advices recently received are to the effect that she is nearly well; but as this is not of importance in the matter under consideration, I will proceed to analyze in greater detail the local symptoms presented.

The appearances presented in this case are very characteristic of prenatal syphilis. The lower eyelashes are quite sparse and the upper ones not as full as they should be, pointing to a former blepharitis. The upper lip is thick and projects in the manner so suggestive of prenatal syphilis. The mouth is partly open in the manner observed in those subject to mouth breathing, and caused in the present instance by the blocking up of the nasal passages. The lesion which would arrest attention directly the patient was seen is the thick, irregular crust implicating the end of the nose. The entire end of the organ is enclosed in this thick, rugous mass with the exception of the right ala. The crust extends down onto the lip on the left side, but stops short at the median line and is limited a very small distance above the carmine of the lip. The extreme roughness of the crust is very well marked, being, no doubt, in great part due to the tentative measures which were employed in the treatment of the disease. Upon raising the edge of the crust, pus could be seen to



Fig. 3. Illustrating Case 3.
(Prenatal Syphilis.)



Fig. 4. Illustrating Case 3.
(Prenatal Syphilis.)

exude rather freely and granulations which would bleed freely when touched were also plainly apparent. Pain could be easily elicited by handling.

Case 4. Sarah L., white, aged 46, is a widow who attributes all her present troubles to her husband. A definite family history cannot be obtained. She states that her parents were healthy and two of the children died quite young of infantile ailments. She has herself always been strong and healthy until she became infected some years ago. It would appear from her statements that she was completely ignorant of her disease until she "broke out all over in little boils," evidently a pustular syphilide of a marked character. Her face was particularly the seat of the trouble, and her nose was covered by the eruption, especially at the end. The patient states that the boils burst and a number of thick crusts formed and that it looked hideous. She also goes on to say that these crusts were disseminated all over the body. She was treated at this time and the

lesions disappeared, but left numerous traces in the form of small, rounded, rather deep scars. At present she is suffering from ulcers on the legs, more particularly on their anterior portions. They are inclined to be chronic, and do not readily yield to therapeutic measures. She has been in the Female Hospital several times, but never remains long enough to permit the obtaining of definite results. Her general state is poor from having had unhygienic surroundings, insufficient diet and generally miserable care. At present there is also evidence of involvement of the spinal cord, and this has been rendered more marked by indulgence in alcoholics to quite a considerable extent.

She complains of cephalic pains, and the bones are beginning to yield evidence of their early implication, in the way of nodes.

The treatment has been mainly increasing doses of iodide of potassium, which seems to give good results, but the drug has never been taken a sufficient length of time to secure any permanent benefit.



Fig. 5. Illustrative of Case 4. (Acquired Syphilis.)

In this case we have a typical termination of the pustulo-crustaceous syphilide of the nose. Scars are plainly visible on the end of the nose, indicating the area occupied by the crust, as well as the number of pustules whose desiccated contents went to form the crust. The pitting produced by each scar is well marked and very distinctly visible in the photograph, although not so much so in the engraving. It may be seen, however, that the alae were also implicated, whereas the remaining portion of the nose was not attacked by the eruption. The disease has not made many inroads with the exception of the ulcers of the legs, which now and then furnish a good indication of what the former syphilitic process was. They are rather small and deep, with sharply cut, well-defined edges. The pustules which attacked the nose were well-defined, rather high, and the purulent process had a tendency to go down rather deep into the tissues. This accounts for the marked pitting. Between the pits the integument is not normal, there having been a light superficial destruction of the upper layers of the skin, leading to the formation of scar tissue, rather thin and not very conspicuous.

Such are the histories and descriptions of a few cases I have had occasion to observe within the past two years, and each one presents certain points of interest to which attention will be drawn later on. The first question which naturally suggests itself is, in regard to the propriety of a specialization of a syphilitic eruption to a particular locality; and yet, in view of the difficulties which may be encountered through the localization of a process, it is well to bear in mind that by calling attention to such, a diagnosis becomes more easily made and more certain than when it is necessary to look for other lesions which may possibly not exist to serve as guides. It is never improper to specialize too much when broad principles are always kept in mind, and when we further remember the useful purposes to which such attention to details may be made to serve in procuring relief to patients and preventing deformities of a marked character and disagreeable nature. The fact that very few, if any, authors have devoted any attention to the particular form of syphiloderm under consideration, as it attacks the nose, is no indication that it is not deserving of more attention than it has received. The fact that it is deceptive in appearance, and apt to lead to a mistaken diagnosis, certainly also indicates the necessity of specifying this form, and it certainly enters within the domain of the rhinologist to familiarize himself with a form of nasal disease as striking as the pustulo-crustaceous syphilide is, and which, when limited to the end of the nose, is very apt to apply to him for relief, more especially in view of the internal nasal complications which may be present.

A cursory examination of the works of syphilologists will reveal an almost confusing mass of names applied to what has, by the consensus of the majority of modern writers on the subject, been called the pustulo-crustaceous syphilide. Older writers and authors were very prone to designate the various luetic eruptions by the name of some non-specific disease, prefixing the adjectival syphilitic, as, for instance, syphilitic psoriasis. To those who have not devoted any extended study to the subject it would almost seem as if we no longer observed the forms which seemed common a half century or more ago. And yet, any one who has had any experience will frequently recognize in cases so-called antique forms of syphilis. Whilst it is true that, in the majority of instances, the symptoms of syphilis are no longer of the same degree of severity as formerly, they are sufficiently so in some examples to serve, in each instance, as a replica of one figured and described at the

beginning of the century. The pustulo-crustaceous syphilide of the nose has been variously denominated syphilitic lupus, phagedena of the nose, syphilitic ecthyma, ulcerating gumma, and by other names which I will not mention. These names were applied, as a rule, after the observation of a single case, and its fancied resemblance to the affection after which it was named. The final nomenclature, based upon the prevailing lesion, which is now almost universally adopted, is certainly the most rational, and has led to a simplifying of the complex of cutaneous symptoms, which is both more comprehensible and simpler. The pustulo-crustaceous syphilide is a term which in itself describes the lesion observed in a very clear manner, and serves to distinguish it from all others. It is essentially nothing more than an intensification of the large pustular syphilide, whose action is not wholly erosive. In some forms of this syphilide the purulent contents are of a destructive nature, and ulcerate to a certain degree, each pustule remaining independent of those in its neighborhood. As a result, rather deep scars are formed. In another form the pustules burst and coalesce. The pus, which is not very abundant, quickly desiccates, and, together with some blood which escapes, forms a brownish-black crust which is more or less thick. The base upon which the crust rests may be eroded, and lead to a rather thin scar when healing has occurred; or each pustule may continue an independent action, and the formation of separate and distinct scars after the crust has separated itself, and healing has occurred. Such an example is shown in figure 5, a rather unusual type of the termination of the trouble; for, as a rule, the end of the nose shows a scar corresponding to the crust which previously existed, attesting to the purulent process existing beneath it.

A question of importance in connection with this peculiar form of syphilis is that which is connected with the diagnosis. This may be best exemplified by a consideration of case 3, which has been described above. Before doing so, it may be as well to call attention to case 2. The eruption which also existed upon the face and neck was pronounced a herpes iris, and the lesions on the nose were regarded as being the same in character. This was before the formation of crusts, and the peculiarity of the lesions was due to the formation of annular vesicles surrounding the syphilitic lesions. This vesicular formation was caused by the fact of the vaccination, which produced its vesicular lesions at those points which offered the least

resistance—the localities where the syphilides existed. The general appearance of the eruption when it became pustulo-crustaceous confirmed the diagnosis I had made, and the rapid improvement of all the symptoms under specific medication served to further fortify it. During this treatment, a typical circinate eruption showed itself in a few places on the face, and made the case a demonstrative one to all who saw it. To return to case 3: It had been treated in various ways, more inefficient the one than the other. A number of diagnoses of the most varied character were made. It was called lupus, and perhaps this was the opinion which most nearly approached a correct appreciation of the condition presented. Epithelioma was the verdict of others, and no sign to carry out such an opinion was present; certainly not at the time I saw it. Another equally unreasonable opinion was that it was tuberculosis, more especially in view of the fact that no attempts had been made to demonstrate the tubercle bacilli. It must be acknowledged that this lesion when limited to the end of the nose presents very faint resemblances to the diseases which were suggested; but to one accustomed to the observation of syphilitic cutaneous phenomena, chancre would suggest itself before any of the others. A chancre of the tip of the nose, when irritated by the application of a caustic, is very apt to develop a crust, and as such means had been employed in the case, the consideration of this possible condition had to be eliminated by the factor of the length of its existence. In cases like this, the diagnosis is rendered particularly difficult, when misdirected treatment has been indulged in. Another factor leading to the possibility of a false diagnosis lies in the circumstance of the limitation of the entire trouble to such a limited locality as the end of the nose. This is why it is absolutely necessary to explore the cavities of that organ in order to find signs which will help to clear up any doubts which may exist. Of course, other signs of an existing syphilis must be looked for, and, in the acquired form, the history of the case, the presence of an eruption, or the existence of scars of former lesions, will form very valuable aids in the formulation of a diagnosis. In cases of prenatal syphilis, like the one under consideration, the classic symptoms of the disease should be sought after, and may be very few or indeterminate. It is here that much discrimination is to be used, and reliance placed upon former observations of cases. The condition and history of former troubles of the eyes, the ears, the mouth, the nose, and the mucous outlets,

should be carefully noted. The teeth should be observed, the glands examined, and every other possible means of aid to arrive at a proper diagnosis utilized. It must never be forgotten that every lesion in a syphilitic is not necessarily of that nature. At the same time, it is equally important to remember that the application of proper specific treatment in the case of a syphilitic will always hasten the reparative process of a process which may attack him.

The frequency of the pustulo-crustaceous syphilide in the acquired form of the disease has never been disputed. The comparatively large number of subjects suffering from this form of eruption is such that it would be folly to dispute the fact that it is comparatively common. Despite this, there are many who endeavor to create the impression that it is either rare or an indication of a malignant form of the process. It certainly is an indication of a vitiated constitution and of inadequate treatment; but beyond this, it means but little. There is no doubt whatever, however, that a particular localization of the pustulo-crustaceous syphilide is a most unusual form. It has a tendency to disseminate itself to a greater or less degree, and when it limits itself to a particular locality of limited extent, it is deserving of more than passing notice or attention. The very fact of its limited localization is deserving of close attention, because this is apt to lead to a false diagnosis or to a misapprehension of the true state of affairs. I have just stated that the localization to a very circumscribed area is unusual; it might be stated with equal truth that it is rare. And among the localities where it is least apt to occur may be mentioned the end of the nose, if we are to judge from the number of cases which have been recorded. A search through rhinologic and syphilographic literature will yield but barren results in this respect. The most prominent writers on the former subject, and all those on the latter, are completely dumb on the subject. Whether this is due to negligence in recording cases, to a mistaken idea that such are common, or to never having seen such, is something which cannot be determined here. It is with a faint hope that more may be recorded that these few notes have been made.

It might be asked why so much stress is laid upon a particular localization of a certain syphilide by the writer, and it may not be out of place to devote a few words to this at the present moment. If the descriptions of the eruption in the several cases detailed have been read with ordinary care, it will certainly be

seen that they possess certain characteristics in common which cannot be found in other eruptions attacking the nose. They are more or less characteristic in nature, and have certain peculiarities which should serve to exemplify them directly they are seen, more especially in connection with the illustrations which are given. They give a certain expression, and lend an expression to the features of such a nature that a mere glance should be sufficient to establish a diagnosis in the mind of the critical observer. An illustration even should be sufficient to impress itself on the mind of the observer to a degree such as would enable him to recognize a similar or analogous case the first opportunity he has to see it. It has been so striking to me that it seems as good a guide in the formulation of a diagnosis as is presented by condylomatia lata, which are regarded as pathognomonic of syphilis. In this form of the syphilide there are certain points and appearances which are such as to immediately awaken suspicion, and, when taken in connection with constant symptoms, should lead to a positive diagnosis, when otherwise a doubt might exist. This, of course, applies to the acquired forms of the disease. And yet when we examine these cases, none is to be found in which the nose is affected at its end only. A cursory glance at the works of a few authors of prominence will demonstrate this fully. Thus, in Ricord's celebrated atlas¹ we can find but a very few illustrations at all resembling cases alluded to. Fig. 3, of Plate 19, depicts a case with a crust on the right ala nasi and shows the tip of the nose to be but very slightly attacked. Fig. 4 of Plate 42 shows both alæ the seats of crusts which also exist upon other parts of the face; whereas, Figure 2 shows the left ala alone, as the seat of the eruption. Plate 45 depicts the face, scalp and right ala nasi as the seat of the pustulo-crustaceous syphilide. The whole is a very unsatisfactory showing, although the plates are above criticism.

In looking over the atlas of Cullerier and Bumstead,² we can find but Plate 23 depicting anything like the condition spoken of in the foregoing. Figure 1 shows a lesion on the right ala nasi, very little on the left, and the bridge of the nose involved. In Figure 2 the entire nose is the seat of the syphilide with the exception of the end. In fact this seems to be the fatal omission

¹ Clinique Iconographique de l'hôpital de vénériens. Par le Dr. Philippe Ricord, 1851.

² Atlas of Venereal Diseases. By M. A. Cullerier and Freeman J. Bumstead, M. D., 1868.

in nearly all the cases figured, showing the infrequency of this localization.

In a description of the pustulo-crustaceous syphilide, Morrow gives an illustration³ of a case (Plate XI) in which the face is involved and nearly the entire nose, except the end, shares in the eruption. This certainly goes far to add to the evidence that the particular localization which has been spoken of, is one which is rare. In the same volume there is given an illustration (Figure 9, page 187) of a tertiary ulceration of the tip of the nose and left ala which somewhat, though indistinctly, resembles the surface which is left after removing the crust in case 3 of the cases I have reported. The difference, however, is sufficiently pronounced to keep any one from making an error.

Before closing, I desire to make two quotations regarding the pustulo-crustaceous syphilide of the end of the nose, which are the only definite allusions I have been able to find in literature. Hutchinson says,⁴ "A remarkable example of the early occurrence of syphilitic lupus was shown in the case of a Mrs. H., who was sent to me by Dr. Batterson, of the Bow Road, in March, 1884. Our patient's nose was deeply notched in each ala, and its tip destroyed, exactly as if by common lupus. Patches of scar and of lupus inflammation extended in her cheeks and upper lip. It had almost wholly healed under specifics. Now it appeared tolerably certain that the syphilis which had caused this ulceration was of only ten months' duration. Her husband had returned to her in March of the preceding year, and she had consulted Dr. Batterson on May 14th for a chancre and enlarged glands in the groin, followed by an eruption. She had a miscarriage in June. Her eruption and sore throat had been severe.

"The patient had been treated by specifics, but only irregularly. During part of that treatment she was in extreme ill-health with debility, etc. It was while she was in this condition, six months after the primary disease, and just after the sore throat had healed, that the lupoid inflammation had attacked her nose.

"It may be suggested as a fallacy that the woman might have had a prior attack. I do not remember ever to have witnessed any eruption so closely resembling lupus at so early a period. The severity with which the patient suffered from the secondary

³ A System of Genito-Urinary Diseases, Syphilology and Dermatology.

⁴ Syphilis. By Jonathan Hutchinson. Commentary XXXVI, page 146. Lupus occurring in the secondary stage of Syphilis.

symptoms makes it probable, however, that this was her first attack; and there was no history of any former one."

In another place⁵ the same author describes a case which closely resembles the trouble under discussion. He says:

* * * "A very similar form of phagedænic ulceration of the nose, but not usually so rapid in its course, occurs in connection with the inherited disease, both in adults and children. It has sometimes been called 'erosive lupus,' or 'lupus vorax.' It is very necessary, however, to distinguish it from common lupus, since, unless the proper special measures are adopted, the patient will be miserably disfigured."

All of the cases we have alluded to and the quotations we have made are possibly not to the point to such a degree as one to which I now desire to call attention, and which has been but lately published by an American who is a close observer. I deplore very much the fact that I can neither give the name of the author nor of the medical journal in which the article appeared. Through some accident the journal containing the account was either lost or misplaced, and I have not been able to give the necessary time to a research to find it. However, a brief sketch of the case, I am able to furnish from memory. The patient, whose case is described, was a rather young woman who contracted syphilis. Later on she developed a syphilide which was rather extensively distributed over the body, but did not possess any remarkable features. After undergoing a course of treatment which apparently cured her, she paid no further attention to treatment. In the course of time she developed a pustulo-crustaceous syphilide which was rather discrete in its distribution. The end of the nose, however, was covered by a marked crust, no other part of the face being affected. The illustration which accompanies the paper is very clear and demonstrative, and the best one I have seen published up to this time. The author very justly considers this an unusual form of localization of this particular syphilide, and he is amply justified when we consider the meagreness of literature on this point. If, however, the accounts and descriptions of the older writers on "scrofula" of the nose be carefully read, many will be seen to be, in all probability, cases of a syphilitic and not of a tuberculotic nature.

The form of pustulo-crustaceous syphilide of the end of the nose to which I particularly desire to call attention is that which

⁵*Loc. cit.* p. 156. Commentary XLIII. Phagedæna of the Nose.

occurs in the prenatal form of the disease. By prenatal, of course, I mean what is generally called "congenital" syphilis, a term which, to my mind, is inadequate as much as "hereditary" is unscientific. I will not take this question into consideration at the present moment, as it is one which would require too much space to discuss it adequately and intelligently. In prenatal syphilis the implication of the nose is internal and not external, as a general rule. In the few thousand cases of the disease affecting children in the manner indicated, I have always found that when the nose is implicated, as it generally is, there is a marked trouble of the lining mucous membrane, of greater or less duration, and, in addition thereto, in a large proportion of cases, the osseous parts, as well as the cartilages share in the process which is present. So far as lesions on the external surface are concerned, we do not find them occurring in this form of syphilis. Strange as it may seem, even the most light eruptions of the early stage of infancy in prenatal syphilis do not manifest themselves upon the nose. They will be seen upon the forehead, the cheeks, the ears, the chin, the lips, or contiguous parts, but never on the nose. The nearest to the nose which I have been able to find and which bears the closest resemblance to a pustulo-crustaceous syphilide is figured by Maclaren, in his Atlas.⁶ In Plate XXIX, Transmitted Syphilis (late), is given a picture of what is called "ulcerating gumma" of the face on the right side of the nose near the alae. Mercurials healed the patient. An interesting fact to note in connection with the case was that the central incisors were of normal appearance. The patient had been treated for scrofula, but with no benefit. This is an experience of daily occurrence and merely confirms the fact that there exists a general ignorance in regard to the diagnosis of syphilis, both acquired and prenatal.

But to return to the nasal disturbances most often observed in prenatal syphilis. It seems almost supererogatory to call attention to the "snuffles" observed within a few days after birth. This catarrhal condition, however, persists for years, sometimes in almost the original form in which it primarily manifested itself. It is not unusual to observe a child six, eight, or even ten years of age presenting this symptom as one of the leading indications of the real trouble which is present. On the other hand, it is more usual to see the nares attacked by another con-

⁶ Atlas of Venereal Diseases. By P. H. Maclaren, M. D., F. R. C. S. E., 1886.

dition, after the fourth year. It is then that crusts begin to form and these are not only tenacious, but they extend deeply into the nares in both a horizontal and a vertical direction. The habit of "picking" them indulged in by the patient is very apt to produce irritation of a more or less inflammatory character, and infection from the dirt upon the fingers or under the fingernails follows this, leading to a purulent formation. This pus may be limited to the mucous membrane, but most often it spreads in a manner such as to bring on destruction, and the natural result is necrosis or rather caries of the vomer, the turbinated processes, and the nasal bones. The openings of the nares are usually the seat of a crustaceous eruption, due to the erosive action of the pus from above. If vigorous measures be not adopted to arrest the caries almost at its inception, it but too often happens that there occurs the typical "saddle-back" nose which is so characteristic of the disease, and which is seen in the acquired as well as in the prenatal cases of syphilis. In all of the latter cases, however, the external portion of the nose presents no appearance of the disease which exists and, it is this very fact which has led to such a complete disregard of the true nature of the affection by physicians in general and many rhinologists in particular. It is for this reason that I have dwelt at some length upon certain details in connection with prenatal syphilis of the nose, and it has been with the hope that they may not be entirely without value or interest to those who desire to pursue the study of nasal diseases in their practice.

In Case 3, which has been described in the fore part of this paper, we have a case of syphilitic involvement in the prenatal form of the disease which is unique, so far as my researches have enabled me to determine. As already stated, eruptions of any sort upon the nose are unusual and lesions at the end of the organ are never seen. Furthermore, the pustulo-crustaceous syphilide at the end of the nose is sufficiently uncommon in the acquired form of the disease, and has never been recorded in the antenatal variety. That it has been seen before, there is no doubt; that it has been recognized is possible. It is for this reason and the great possibility of making mistakes that so much stress has been laid upon a lesion which, at first glance, may seem to be of less importance than has been attributed to it. Be this as it may, a case which, up to the present, is unique, certainly deserves more than a passing mention. A question which naturally arises in connection with the case in

question is as to whether we are justified in looking upon it as an example of what Fournier has designated as Syphilis héréditaire tardive? The history of anterior signs or symptoms of the disease is so indefinite and unsatisfactory that it would indirectly confirm the opinion that it was a late form. In fact, the symptoms presented when first seen would also tend to support such an idea although the patient was not as far advanced in age as is generally claimed for these cases of late prenatal syphilis. In view of the fact, however, that this peculiar phase of syphilis is not only not well known, but its very existence derided by very competent authority, no objection of any validity can be entered against calling a case of fourteen "late" hereditary as well as one of eighteen. The point lies chiefly in the circumstance that, according to all the information available, no definite symptoms of prenatal syphilis had manifested themselves prior to the lesion at the end of the nose and those connected with the nares and mucous membrane of the cavities. That the case was not of the acquired type is very plainly evident from the absence of cutaneous eruptions and also from the few symptoms present plainly indicative of the prenatal form. A comparison of the illustrations given will show this, as well as the inspection of the various plates and illustrations to which references have been made.

So far as my search through the literature of prenatal syphilis has shown, Case 3 is unique. Not only are no similar cases figured, but no description of such a one can be found. The nasal troubles, as has been remarked, are either limited to the interior structures of the nose, or distributed about the openings of the nares, the upper lip, or the *alæ nasi*. In the very few acquired cases which have been described and of which illustrations have been published, the face is always also implicated. The eruption is not regular by any means and the body always shares in the process. In each case an unmistakable and clear history is present.

The treatment of the pustulo-crustaceous syphilide should not only be internal but local as well. In the acquired form the internal treatment should be either mercurial or mixed, according to the indications presented by each case. No fixed rules can be laid down, and to point them out would require almost a complete treatise on the treatment of syphilis. In the prenatal form, however, there can be no doubt of the propriety of using mercurial treatment alone. It is beyond all question of a doubt the only rational remedy to employ and the

results are proof of the truth of the assertion. Locally, it will be found that mercurials of a mild character will procure the best results. Caustics are not to be used, as a rule, and when found necessary they are to be applied with a cautious hand. The destruction is not of a virulent form, such as is observed in phagedena, and on that account, need not be used as energetically as many do. Much depends upon the judgment of the physician in the matter, and a little caution is always to be commended.

The results observed in cases of ulcero-crustaceous syphilide of the end of the nose are very much the same as we observe in other localities. The destructive nature of the process always manifests itself in the form of scars. In all the cases figured in this article scars followed the eruption. A fair idea of their appearance and distribution may be formed by a reference to the illustration of Case 4. The scar following each pustule is distinct and the number is an evidence of the aggregate form of the eruption, and the area occupied by them will indicate the comparative size of the crust which existed upon the end of the nose.

Such is a brief outline of a nasal lesion which should certainly possess more than a passing interest for the rhinologist. To the syphilologist each case contains points of value, and to every practitioner it should indicate a hitherto almost untrodden path in the field of the investigation of disease. It must not be supposed that because cases of the prenatal form of the pustulo-crustaceous syphilide of the end of the nose have not been described, that it is by any means rare. It may have been mistaken for something else, and being attended by a bad result was never reported. I have seen several cases of complete destruction of the end and of a large part of the nose, due to prenatal syphilis. From the descriptions furnished I have no doubt that they were originally lesions of the pustulo-crustaceous form, which were unrecognized and not properly treated. If the few notes which I have made awaken some interest in the subject, I shall have been fully rewarded.

EXAGGERATED ARYTENOID MOVEMENT — AN-
CHYLOSIS OF THE CRICO-ARYTE-
NOID ARTICULATION.

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Compensatory Arytenoid movement is not an uncommon condition, being frequently seen in paralysis of the larynx. Exaggerated bi-lateral movement of the arytenoids is, however, rare. The former condition presents a laryngoscopic picture which shows an oblique line of approximation in phonation. In exaggerated arytenoid movement, as illustrated by the following case, there is no distortion of the line of approximation:

Fig. 1.—J. N., actor, aet., 36, consulted me on Aug. 24, 1896. Owing to a gradual weakness of his voice, he had been obliged to give up his work as leading man temporarily, expecting however, to resume within a few days. For years he has been subject to frequent loss of power in his voice, and at various times has been obliged to rest for several days. His voice has a pleasing character, being rather low and well modulated. Its carrying power, however, is very poor, and when attempting to play parts requiring shouting or prolonged loud vocal effort, he becomes hoarse. It was after a week's performance of this kind that he consulted me, having noticed the trouble coming on gradually for several weeks.

Examination of the larynx revealed the following: uniform redness of the entire laryngeal lining, slight muco-purulent secretion, right vocal band normal in color, left slightly streaked with red. During inspiration no especial motor alteration was noticeable; in phonation a most peculiar condition was presented. The left vocal band showed the characteristic ellipse of paresis of the internal tensors, but an exaggerated motion of both arytenoids was distinctly made out.

Upon expressing surprise at the peculiar laryngoscopic image, the patient informed me that all who had examined him in the past

had expressed the same astonishment, and that he believed the peculiar appearance had always existed, for, as stated above, a high tone was produced with difficulty, and the voice had never possessed the carrying power so essential to public speakers. Moreover, the quality of the voice, while pleasing, became, after a time, monotonous, due to its limited range. The exaggerated motility of the arytenoids seemed symmetrical, and upon phonation the posterior segments of the vocal bands were closely approximated, while the right arytenoid passed well in front and the left well behind. It was not a picture such as is seen in paralysis of one vocal band in which the unaffected band passed beyond the median line behind the other, but an equal motion in both arytenoids was plain.



Fig. 1. In phonation.

Under treatment by local astringents, strychnine and Faradism, the temporary tensor paralysis readily yielded, and the permanent condition became more pronounced.

The following case is presented in order to emphasize a peculiar cause of immobility of the vocal bands and arytenoid cartilage, as well as to illustrate the value of intubation in such cases.

Fig. 2.—W. D., colored, male, age 26, was admitted to the Arapahoe County Hospital July 31, 1896. Having been arrested for some disturbance, he attempted to end his life by cutting his throat with a razor. He was admitted to the service of Dr. L. Freeman, who found the trachea severed at the third ring. The external wound was about four inches in length, but there was nothing of importance injured except the trachea. A deep suture brought the edges of the severed trachea together and the wound was allowed to granulate until Aug. 14th, when the granulating surfaces were brought into apposition by several additional sutures. The case was discharged from the hospital August 18th, although there still existed a small fistulous opening in the center of the neck, for which he presented himself at the hospital at regular intervals.

During the healing process there developed some dyspnoea, attended with stridor, which came on with rapidity, but did not apparently become worse or alarming. Several days after his discharge from the hospital, I was asked to see him on account of the disturbed breathing, which was especially marked upon exertion. The difficulty was principally inspiratory and attended with a loud whistling stridor, frequently becoming "wheezy" in character. The voice was loud and of good quality, although somewhat hoarse. The dyspnoea unfitted him for any occupation, although he felt able to work in every other respect.

Laryngoscopic examination was conducted with some difficulty, but, under powerful illumination, there was revealed a condition as represented in Fig. 2. During inspiration the right vocal band made its proper excursion; the left, however, remained in the median line and was slightly red in color. The left arytenoid was swollen, red and stationary in phonation and inspiration. A few granulations were seen in the anterior wall of the trachea, at which site a purulent secretion was found. This marked the position of the tracheal fistula above alluded to. It was evident that the cause of the dyspnoea was in the immobility of the left vocal cord, and after being able to discard injury to the recurrent laryngeal nerve, because of the late appearance of the laryngeal symptoms, it was concluded that the cause of the difficulty was to be found in an anchylosis of the crico-arytenoid articulation following upon inflammatory action during the healing of the original wound.

The treatment was based upon this diagnosis. The pharynx and larynx having been cocaineized, a large-sized male adult intubation tube was passed into the larynx. The first attempt was made with the laryngeal mirror, but failed. The second attempt was successful without the mirror, but was accomplished only with the exercise of some force. As the tube was forcibly pressed between the vocal bands, a sensation of something "giving way" was experienced



Fig. 2. In deep inspiration.

by the operator and by the patient. The presence of the tube gave rise to so much discomfort in the trachea that it was removed, but reinserted five or six times at this first sitting. The immediate result was to relieve the stridulous breathing. At intervals of two days the tube was passed for a period of one week, when the patient expressed entire relief from dyspnoea on exertion, and desired to go to work. He is at present under observation and presents himself once a week for intubation, which is now accomplished under the laryngeal mirror. The object of continuing the treatment is to prevent cicatricial contraction and the further development of granulations at the site of the wound, as well as to prevent a recurrence of anchylosis. The laryngoscope shows the left vocal band and arytenoid cartilage slightly moveable in phonation and respiration. Its excursion is not, however, complete, being found during deep inspiration abducted slightly external to the cadaveric position.

In intubating adults I have been impressed with a difficulty to which others have called attention. Even after cocaine anaesthesia the larynx contracts powerfully upon the attempted entrance of a foreign body. This is overcome by holding the tube with some pressure over the laryngeal opening until the spasm passes away, when it easily slips into position.

ACUTE INFLAMMATION OF THE MAXILLARY
SINUS, AND THE QUESTION OF ITS
SPONTANEOUS CURE.*

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OF FRANKFURT, GERMANY.

Translated by W. SCHEPPEGRELL, A. M., M. D., New Orleans.

It was already my intention last year to present some remarks before this Special Congress (South German Laryngologists, Heidelberg, May, 1896), on the subject of acute inflammation of the maxillary sinus, but my own experience and study of this subject, which is still an almost undiscovered territory, were not sufficient to enable me to fully understand the meaning and regularity of the symptoms, so that I willingly postponed this undertaking.

During the entire past year, however, I have given particular attention to this special question, and I am now prepared to bring some remarks and observations before you, believing that I may now present to you a fairly clear exposition of the symptoms and cure of acute empyema of the maxillary sinus.

Although the literature of chronic empyema of the maxillary sinus has greatly increased in recent years, still little has been said on the subject of acute empyema.

And why is this the case?

Zarniko writes on this subject: "The greatest number of cases remain undiagnosed, either because the patients mistake their affection for a severe 'cold,' and seek medical aid only when this does not subside after a considerable time, that is, when it has reached its chronic state; or because the empyema is obscured by the other symptoms present, as in many acute infectious diseases."

There is no one, probably, who will gainsay these two causes. When, however, we wish to get at their true meaning, the real cause will be found, on the one hand, in the primitive indolence

* Archiv. f. Laryngologie und Rhinologie, Heft 2, Band 4.

of the patients, and, on the other, in the defective diagnostic skill of the physicians. This latter evil is especially the case in the hospital service in Germany, where physicians, skilled and interested in rhinology, rarely ever hold office in the internal and surgical departments, not even in an advisory capacity. As an example and voucher of this circumstance, I refer to the classic work of Eugene Fraenkel, of Hamburg, who claims that of his 146 cases of diseases of the accessory cavities, not a single case was diagnosed during the life of the patient. If the exclusion of the specialists from the larger hospitals is responsible, on the one hand, for the paucity of observations on acute empyema, the circumstance, on the other hand, that the specialists in most places, even in the first year of their practice, exclude themselves entirely from general practice, accounts for it that so few cases of acute empyema of the maxillary sinus come under their observation.

A number of general practitioners, it is true, call the specialist to their aid when circumstances demand it, but this, however, usually happens only after unsuccessful efforts of their own to cure the case: that is, when the case is no longer in its acute stage; and besides this, a portion of the cases of acute empyema of the maxillary sinus pass through their course under symptoms which are observed neither by the patient nor the physician who has had no experience with this disease.

In order not to take up too much of your valuable time, I will refrain from giving you a full history of my cases of acute empyema of the maxillary sinus (I have the report of ten such cases, of which I have made the most careful observations), and will limit myself to reading only a few cases which I believe to be characteristic, and which have points of special interest. I will first call your attention to a case of bilateral acute empyema of the antrum of Highmore:

A colleague, Sch., of Bischofshelm, had, in November, 1896, an attack of influenza with acute empyema of the right maxillary sinus, which healed in four weeks without interfering with his practice and without any treatment. On the 16th of December, 1895, he had another attack of influenza with vertigo, vomiting, loss of appetite, cough and sneezing, and pain in the head and back. On December 22, 1895, soon after rising, a painful pressure developed in the *left* superior maxilla, which usually extended beyond the nasion to the forehead; the pain increased, gradually diminishing in the evening, and resembled the pain which he had two years ago in the *right* superior maxilla. The next day the condition of the colleague was so much aggravated that he was compelled to remain in bed. He had severe pain in the cheek and forehead, which became worse with every movement, especially on bending the head forward, and also on coughing and sneezing. There was pain on pressure over the

region of the *left* superior maxilla and also over the *eyeball*, and there was photophobia; the sense of smell had entirely disappeared; the administration of small amounts of alcohol caused marked increase of pain; there was a copious purulent discharge from both nostrils; the nose was occluded when the patient reclined on his back; there was no appetite, and the evening temperature was 101 degrees; towards evening the pain in the head diminished regularly in intensity. On the fourth day a painless, edematous swelling of the right cheek and of the right eyelid developed; morning temperature, 101 degrees; evening, 102 degrees. The patient was continuously confined to bed.

During the next few days the symptoms on the *left* side became especially violent; at three o'clock in the afternoon the fever rose to 103 degrees; towards evening there were repeated paroxysms of copious perspiration, and the sensorium became dulled. Dr. Fisher, who waited on the patient, states that the speech became disconnected, the end of the sentence being frequently forgotten and the photophobia became very marked; on the ninth day the evening temperature rose only to 102 degrees.

On January 3rd I saw the patient for the first time. He was confined to bed; a conversation could be maintained only with difficulty. On inspection, pus could be seen in the middle meatus of the nose and on the inferior turbinates on both sides; there was pain on pressure in the left cheek bone; there was pain in the supraorbital and glabella region; the teeth were in perfect condition. As the trouble was now chiefly referred to the left antrum of Highmore, I washed it out through a puncture made from the inferior meatus, which resulted in the discharge of considerable pus. The improvement which is usually observed (at least by me) after irrigation, did not occur until two or three hours later. Either the swelling of the mucous membrane of the maxillary sinus was still so marked, or a similar diseased condition existed in the opposite sinus, and prevented the result which is usually seen after opening and washing out this cavity. At the next irrigation, which took place in the forenoon, while the first was done in the evening, one tablespoon of pus came away, with immediate subjective relief to the patient.

The right maxillary sinus continued to be painful and to discharge pus. By a mutual understanding, however, this side was not treated, a puncture and irrigation being made simply in order to confirm the diagnosis.

On the left side an opening was made in the fossa canina with a drill and electric motor. The patient drove home, but he was unable to find the opening the next day, in order to syringe the cavity. Therefore, this procedure can not, in my opinion, be considered as having been a therapeutic measure. During the following days, without further syringing, the sense of smell became better; the secretion diminished; the appetite improved, and on the 8th of January, 1896, that is, fifteen days after the first irrigation, and three and a half weeks after the commencement of the disease, the patient was relieved of all his symptoms, except a slight pain in the forehead, which he felt after writing a long time and on bending his head forward.

Five months subsequently, the patient had had no relapse and suffered no inconvenience.

This clinical history has been very instructive to me in many ways; first, because the patient was a physician and could make careful observations of his own case, and secondly, because it enabled me to note the following observations: As shown by

the report of the patient himself, edema developed on the first day of the bilateral empyema of the maxillary sinus, and affected both the cheek and the eyelids. You will recall the fact that I have attempted, on a previous occasion, to call your attention to this symptom. The edema in empyema of the maxillary sinus develops more especially in acute suppuration. This, and its often fleeting character, no doubt account for it that it has been so little observed. I have seen it more frequently during the past year, as for instance, in a lady who had a marked attack of acute empyema of the left maxillary sinus, after having been cured by me, two years previously, of a chronic empyema of the maxillary sinus affecting the opposite side. Carl Frankel, D. D. S., of Frankfurt, whom I called in to extract the tooth, will corroborate this observation. The edema on this occasion was *bright red*, inflamed, and of an erysipelatous character, and involved the left cheek and the left eyelid. On the cheek, it extended to the angle of the mouth, so that the patient, in spite of her previous experience with empyema, believed that she had erysipelas. The edema continued for six days, and remained two days after an opening had been made through the alveolar ridge.

In addition to this, Dr. Deutsch sent me a case of acute empyema of the maxillary sinus, which he reports to me as having suffered for three days, in addition to pain and suppuration on the left side, from edema of the face, which involved the left cheek, and extended from the nose to the left lower eyelid.

You will therefore see that I am in a position to refer you to three physicians who will vouch for me regarding the presence of edema in empyema of the maxillary sinus. I lay special stress on this corroboration, because, in the first place, I give little weight, in this connection, to the personal observation of the affected patient, who is apt to mistake the swelling of the eye following a night of excesses for edema, and, in the second place, because there are certain specialists who doubt the occurrence of edema in acute empyema of the maxillary sinus. Finally, I have succeeded, in my examination of the foreign literature on this subject, in finding a personal observation by Moxhem, who experienced pain and *swelling* over the left antrum in his attack of acute empyema of the maxillary sinus; also a personal observation by Felix Semon, who describes the skin of his cheek as having being reddened and *swollen* to the point of causing tension on the affected side; also a case of Lenox Browne, who had a case of acute inflammation of the antrum following influenza, which

likewise, presented *swelling* of the right cheek. Thus my observations are also corroborated in English literature.

I wish to insist, however, that I am convinced that edema in acute empyema of the maxillary sinus is no rare occurrence, as it would appear from an examination of medical literature, but a *regular symptom*. You will, perhaps, be surprised that I lay such weight on this apparently unimportant observation. Edema of the eyelids is, no doubt, also present in inflammation and supuration of the frontal and ethmoid sinuses, but edema of the cheek, especially when it is present without a similar condition of the eyelid, is not an unuseful diagnostic aid in the differential diagnosis between acute inflammation of the frontal and of the maxillary sinus. Edema, too, is such a conspicuous symptom that it would aid even the unskilled physician in recognizing empyema.

In addition to this, the above case teaches us that *acute empyema may develop very severe symptoms*; the patient has *fever*, his intellect is dulled, he has *photophobia*, his speech is defective; his complaints are *urgent* and his *sense of illness very marked*; the appetite is entirely gone, and the sense of smell is completely absent.

You will acknowledge, no doubt, that this clinical picture in nowise resembles the train of symptoms present in chronic empyema, and that the office of the specialist is not often the place where such patients will be found.

When, therefore, we find in Zarniko's and in a number of other text-books: "The symptoms of acute empyema resemble those which are described in connection with chronic empyema," it simply shows that thorough and correct observations of acute empyema have thus far not been adequately published. For this reason, I will beg your indulgence to sketch a few more clinical histories belonging to this subject.

On October 24th, 1895, a tubercular patient, M., whom I had already treated for six years on account of his pulmonary trouble, called on me and complained that he could not concentrate his thoughts, and was excitable and unfit for business. As the patient had now come to a physician who made it a routine practice to make a rhinoscopic examination of every patient, it did not take long to discover a stream of pus on the septum and under the middle turbinate, which explained the reason of the patient's inability to carry on his work, and which led me to the diagnosis of acute empyema of the right maxillary sinus, which was corroborated by an exploratory puncture and irrigation. The patient afterwards informed me that he had taken a severe "cold" fourteen days before, after taking a cold bath. Eight days before, the right nostril had been much obstructed, when suddenly it discharged a quantity of fetid pus. The patient complained of no pressure in the antrum of Highmore and

of no pain in the nose, except when pressed, but there was a disagreeable dripping from the left nostril whenever he had occasion to bend forward, the discharge sometimes continuing for hours.

When the antrum was again syringed out the following day, the water came away almost clear. The same result was obtained October 28, 1895, and January 1, 1896. In other words, for three months no more pus could be found; the patient was cured.

In this mild case, which I purposely place in contrast with the severe case above described, the following points are to be noted:

1. This is not a case of an inflammatory process following influenza, but an affection of the cavity complicating rhinitis. 2. Hence, the mild symptoms. 3. Hence, also, the rapid cure for which a single syringing sufficed. In regard to the question as to whether the single irrigation, which had simply a *diagnostic* object, and which was done with ordinary lukewarm water, could have had a *curative* effect; in other words, that this was not a case of *spontaneous* cure, we will refer to later. This much is certain, that there was fetid pus in the antral cavity: that is, that there had been an acute empyema of the antrum of Highmore, for about 14 days.

It may appear curious to you, perhaps, that I deemed it necessary to again irrigate the cavity in this case as late as three months afterwards, in order to convince myself that a cure had really taken place; but the rapid improvement, on the one hand, was a surprise, even to me, and, on the other hand, it has been my experience to observe that such a rapid cure may be a *delusion*.

As an illustration of this possibility, I will give you the report of the following case which came under my observation: In January, Mrs. G. had a slight attack of "influenza;" four weeks afterwards, while the general condition was otherwise normal, she suddenly felt pain in the left cheek and in the left eye; there was a purulent odor, edema, and, on the following day, a discharge of pus from the nose. The temperature was between 101 and 103 degrees. The pain was very severe and was not diminished by antipyrine or by morphine administered internally. There was continuous nausea and vomiting; the night rest was much disturbed, especially from the suppuration which continually dropped into the throat. In view of these symptoms—I wish to emphasize the fact that only on account of the severity of the suffering—I drilled an opening through the alveolus as early as the fourth day. Much pus was discharged. From the day following the operation the patient was entirely without fever, and there was marked improvement in the general and subjective condition. Pus continued to come away with syringing during the three following days, but after this there was no more discharge, so that eight or ten days after the operation, the syringing was discontinued, and the opening which I had drilled was allowed to close.

Exactly sixteen days later, the patient again applied, in great distress, and complained of the odor and taste of pus, obstruction of the left nostril, etc. I quitted her, although I found pus under the middle turbinate. Three days later the symptoms of acute empyema of the maxillary sinus were again so marked, that I again found it

necessary to open the original puncture with the drill and electric motor, and again pus was found in the antrum. This case, therefore, shows us that *an empyema of the maxillary sinus is not necessarily cured, even when there is no discharge of pus for eight days.*

The following case of acute empyema of the maxillary sinus, which was referred to me by Dr. Deutsch, I mention only on account of the following points: first, that after the use of the nasal douche, which he had been ordered to use for the treatment of an acute empyema of the *left* antrum, there developed, on the following day, an empyema of the right side, which soon subsided. Is it not possible, in this case, that the stream of water which was syringed into the diseased nasal passage, and mechanically transferred the pus to the healthy side?

Secondly, the empyema disappeared in seven days. The pus, which was discharged with the first syringing, was not yet fetid, and it was also not a case of empyema due to influenza, but to an ordinary coryza with extension of the pathological process from the nose. The commencement of the empyema was acute, and showed, as its first symptom, pain on the *anterior half of the left cheek*, in the region of the infraorbital nerve, as far as the jaw, so that the patient himself believed that he was suffering from *toothache*.

In the third place, I tried, for the first time, in this case, the suction of air in the nose during the act of swallowing, or, we might say, the negative politization, in order to draw pus from the cavity for diagnostic purposes. This experiment is frequently successful.*

Its efficacy, however, like similar experiments, viz.: Valsava's bending the head forward, trans-illumination, etc., does not compare with the reliability of the direct irrigation of the cavity.

I deem it also worthy to mention the following case of bilateral subacute empyema, which I observed, which developed suddenly during an attack of coryza, with severe headache and swelling of the cheek, and in which a *fairly large polypus of the left middle turbinate was found to have developed within six weeks after the first appearance of the suppuration*. This is the only case, confirmed by an exact description and by clinical observation, which I have been able to find in which the *development of polypi during the suppuration of an accessory cavity* has taken place before the sixth week.

I will omit, however, the remaining cases, and will only mention that among them is one of bilateral empyema in a child suffering from *measles*, and also a case of hemorrhagic empyema. I have already reported the case of acute empyema following the galvanocauterization of the middle turbinate. This case healed, after being syringed five times.

Finally, I, myself, had an attack of acute empyema on the left side during the time that I was engaged in preparing this communication. I have already suffered from such an attack on three occasions. The symptoms were the known typical ones as described by Semon and others in their own cases. It healed spontaneously.

In drawing a few conclusions from the cases which I have just reported, and from those which, owing to the shortness of time, I cannot here describe, I would present the following propositions and offer them for discussion:

*In regard to this measure, the reader is referred to the translator's comment on "Moll's Treatment of Acute Diseases of the Accessory Cavities of the Nose by Respiratory Aspiration" (Annals of Ophthalmology and Otology, July, 1896), in which the impracticability of this method is shown from the physical relations of the maxillary sinuses to the nasal passages.

1. Acute inflammation of the antrum of Highmore is of very frequent occurrence.

2. In this affection there are *severe* and *mild* cases. Of the latter, several have already been described in English literature. Of the severe cases I could find no report, although it certainly must have been frequently observed.

3. The *mild* cases have the following characteristic symptoms:

A feeling of painful pressure and tension of the *inner half* of the superior maxilla; purulent, and frequently bloody, irregular discharge, which does not develop according to the regular type of chronic empyema. The pain is increased on bending, coughing, pressure and defecation.

The secretion does not cease entirely during the night. Frequently a soft edematous swelling of the cheek and eyelids presents itself, so that the edematous part has a *bright red* color; supra-orbital pain is rare; a fetid odor is sometimes, but not always absent.

4. The severe cases have all the symptoms of the mild, but present, in addition, the following:

Considerable elevation of temperature, apathy, photophobia, a sense of severe illness with urgent complainings of the patient, who is confined to bed; profuse secretion, nausea, vomiting, difficulty of mental concentration, and strong depression of spirits.

These severe cases of acute empyema are noted not only in cases complicating influenza, but also in those which develop spontaneously.

5. Acute empyema *recurs very easily*, an ordinary coryza being sufficient to *again develop* the morbid condition.

6. The bilateral affection, I saw as frequently as the unilateral.

7. The issue into a chronic state I saw only once in ten cases.

8. Acute empyema may also cause the development of polypi.

If I must now submit to you the opinion which I have formed, regarding the *spontaneous cure of acute empyema of the maxillary sinus*, I would formulate the following propositions:

Mild cases almost invariably heal spontaneously; relapses, however, are frequent. My collective cases have all been tested (although not in every instance by myself) by puncture and irrigation through the inferior meatus, so that there could be no doubt as to the existence of an empyema. The cure, also, I

made a point of substantiating by this method, and did not depend on the very uncertain method of trans-illumination or the unreliable report of the patient.

I am free to acknowledge that a single irrigation, made for a diagnostic purpose, may have a curative influence, especially for the reason that the cavity was cleansed at least *once* of the irritating pus, and thus favored the absorption of the *renewed* secretions by way of the lymphatics.

The cure always progresses gradually; the symptoms diminish daily; the attacks of pain occur later in the day, their violence diminishes, and the suppuration becomes less purulent and diminishes in quantity.

In spite of the fact that the spontaneous cure of acute empyema is extremely probable, nevertheless, I was compelled to resort to *artificial irrigation* in three cases, on account of the *violence of the symptoms* and the *great severity of the pain*. It therefore appears to me a matter of little consequence, whether this irrigation is effected from the inferior or the middle meatus, through the natural opening, the fossa canina, or through the alveolus.

It is not the location of the opening for the irrigation, which decides the rapidity and the reliability of the cure, but the nature of the empyema. The composition of the irrigation liquid appears also to be of little consequence, the important point being the thorough cleansing of the cavity. The character of the empyema is no doubt also influenced by the nature of the bacterial infection, but the examinations undertaken thus far have given no light which could guide us in the prognosis of the case. At best, these examinations can offer but little information on this subject, as it is only the *cases which are not yet cured* which can be examined.

(Dr. A. C. H. Moll read a report last year, in Arnheim, on the treatment of acute affections of the accessory cavities of the nose, that is, on the symptomatic therapy, not on the disease itself. His observations are, above all, open to the error that his statements, concerning the acute inflammatory processes, were not corroborated by exploratory punctures. Why this is the case I am unable to state. Burger also reports several cases of empyema complicating influenza, but in which the diagnosis was made only through the method of transillumination, and which he treated successfully by repeatedly syringing the nose, and not the cavity itself. In other words, that he allowed a spontaneous cure to take place. Such is our extensive history of the subject of acute inflammation of the maxillary cavity.)

It has been my object to present to you such points as have been taught by simple, but, as far as possible, exact clinical examinations, and to impress upon you that the universal surgical verdict, "ubi pus, ibi evacua," has its limitations when it refers to acute empyema of the maxillary sinus. In such cases only in which a spontaneous cure does not take place within three weeks, or when the suffering of the patient demands it, would I feel justified, in the future, to also make a systematic opening into the sinus in acute empyema, and to irrigate the cavity daily.

No doubt other physicians have made similar observations, but none have thus far been published. It has always appeared to me an important object to make an analytical study of the subject of *acute* empyema of the maxillary sinus from the reports of single cases, and to present separately its symptomatology and prognosis.

One of my special purposes to-day was to draw your attention to the fixed landmarks between acute and chronic diseases of the sinuses from my personal experience, so as to put a stop to the *confusing talk* of the *rapid cure* of empyema from this or the other therapeutic measure, and that the *symptomatology and prognosis of acute diseases of the maxillary sinus might no longer be included with those of the very different chronic empyemas.*

THE AURA OF AURICULAR VERTIGO.

Dr. Gellé.

ANNALES DES MAL. DE L'OREILLE, ETC.

Translated by H. A. Alderton, M. D., Brooklyn.

Since Flourens' experiments it is known that wounds of the auditory nerve, and even of certain parts of the nerve, provoke motor manifestations, organized or disorganized, belonging in a certain sense to the injured part.

The disturbances of equilibrium of standing, of swimming and floating are perfectly understood by physiologists.

The clinic furnishes us, moreover, in auricular pathology; in the syndrome of otitic vertigo, called Meniere's disease; the clearest types, the best established of the diverse motor disturbances which may result in man from lesions of the auditory apparatus, when the labyrinthine expansion of the auditory nerve is injured by the progress of the morbid process.

Clinical observation furnishes us, however, with other ideas upon the effects of these lesions of the acoustic than those given by experiment upon animals; the information brought by patients in full possession of their faculties is more explicit and more complete and differs necessarily from that gained by experiment upon animals, which, though curious certainly, is limited to motor and stability troubles.

The irritation carried by the terminal ramifications of the acoustic occasions in man other phenomena than those of equilibrium, impulsation and stability.

This is what the analysis of auricular vertigo, will clearly demonstrate.

From the study of several hundreds of irregular observations of auricular vertigo, it is seen in more than a quarter of the cases there exists a veritable aura, premonitory of the approach of

vertigo; and that this offers special and distinct characteristics which certainly refer it to hallucinatory phenomena and demonstrate the participation of the psychic centres.

It is known that at the beginning of the vertigo the patient oftenest perceives sudden intense whistling, a classical sign of its approach. However, this subjective sensation is variable, sometimes it is a sound of detonation, again a fusillade, a crepitation, a crackling; sometimes cries, crackling in the head or neck are suddenly produced. Some hear sighs which mount from the neck toward the head, or toward the ears, or follow the ascending vascular fissures of the neck; the dizziness and the rest come afterward.

As an initial otitic phenomenon I find painful hearing; more rarely a sudden deafness, and the vertiginous symptoms follow.

Vertigo begins frequently with visual disturbances, associated or not, soon afterward, with the subjective phenomena of noise and so forth. There are dazzling lights, or on the contrary, smoke, blackness, flames, zigzag fires, as in ophthalmic migraine; again, there is cloudiness of intellect (obnubilation) and sudden abatement of vision: the patient complains of diplopia or of incapacity to fix the gaze; he sees butterflies, clouds, caverns, objects in movement, in rapid rotation, precipitated indefinitely; the ground opens, a gulf appears at his side; he has the sensation of elevation, of falling; bizarre sensations of images in motion, or movements of his body; veritable hallucinations, rapid fantastic visions, and ending quickly in motor perturbations and finally falling into demi-syncope. Very often the aura is a subjective sensation of a more general order. There are pains through the head or extending from the face to the neck or the ear suddenly; sensations of something displaced from right to left, from the palate to the ear, from a part of the ear; sometimes it is a shock, one or more blows upon the head, neck, back, buttocks, etc., but oftenest upon the back of the neck with or without immediate pain, and the attack develops. The shock received is sometimes severe enough to cause a groan; or such that the subject cries out and feels as if thrown to the ground, retaining consciousness of his situation. I have noticed this cry six times at the beginning of auricular vertigo, at the appearance of the prelude to the attack recognized by the patient.

Gastric disturbances often open the series; nausea, vomiting, more or less repeated and abundant, preceding the whistling, the dizziness and the final condition of inhibition. The cry points to grand mal, the gastric troubles to indigestion.

At the same time extreme disturbances of the vaso-motor innervation are manifested, heat in the face, head and ears,

announcing the approach; the same with cold sweats, chills, diarrhoea (one case), pallor, and soon the whistlings, the vomitings and the demi-syncopal state appear.

Again, disturbances of stability and equilibrium and the diverse motor impulsations, which are the substance of Meniere's vertigo, may mark the sudden attack; it is in rising, in movements of the head or eyes, in eating, in swallowing, in blowing the nose, that it is shown that the otitic vertigo is far from being always spontaneous. Besides, aeration of the tympanum, centripetal pressure, etc., sometimes cause vertigo, either the sensations already mentioned or of movement or total inhibition. In aura of this order is noted the fixity of the gaze, the stiffness of the neck, the inclination of the head upon the shoulders, the involuntary rotation, that of the eyes, the strabismus, the oscillation of the body, and the instability even in bed, etc., sudden precipitations upon the ground without other warnings, or on the contrary, a general resolution with pallor, obnubilation and menacing of syncope.

However, the patient assists at the crisis, he follows it, he recounts it, he feels it coming, thanks to the aura, and may often prevent grave consequences (fracture, falling from a height or in the street). Again, the subject, calm in his chair, will enumerate all his visions, his hallucinations, his mental representations, motions, terrifying, increasing his dizziness, the impulsions succeeding each other without pause, with rapidity and fatality up to the fall upon the earth.

CONCLUSIONS.

This picture of sensorial phenomena, sensitive or motor, premonitory to the access of auricular vertigo, shows us clearly that the irritations of the auditory nerve produce in man not only the diverse perturbations of equilibrium and movement that the experimenter studies in the laboratory, and which are so well known, but that, moreover, they act upon the psychic centers, provoking the appearance of veritable hallucinations of the senses and movements that only clinical observation can teach us.

TREATMENT OF LABYRINTHINE VERTIGO.

Gellé.

ANNALES DES MAL. DE L'OREILLE, ETC.

Translated by H. A. Alderton, M. D., Brooklyn.

Labyrinthine vertigo is easily confounded with that due to disease of the nervous system. The former frequently succeeds to lesions of the middle ear, but not less often may be associated with cerebro-spinal or mental affections. In the first case, the labyrinth is forgotten, the attention being fixed upon the middle ear; in the second case all is attributed to the encephalon, or to cerebral troubles, and the same mistake is made.

The labyrinthine origin of the disturbances of movement and of equilibrium is anatomically explained by the intimate connection of the vestibular and ampullary nerves with the cerebellum and its peduncles. This is experimentally demonstrated by Flourens and confirmed by many operators. It has been proved (since) by Meniere, by the necropsies exhibiting hemorrhage, and suppuration of the semi-circular canals and of the vestibule in patients afflicted with vertigo; finally, it is clinically proved by observations which show the intimate relations of the otitic lesions and of their evolution with that of vertigo.

I would add a personal demonstration, experimental, though clinical, proving that it is possible sometimes to provoke vertigo by working upon the ear, by Politzer bag pressure, and so forth.

Again, vertigo is much less often spontaneous than is believed; it is caused by the act of swallowing, of blowing the nose, of masticating, of exerting one's self, by movements of the head, by noises, by spasms of the tensor, etc.; causes incessantly active and common.

Labyrinthine vertigo presents a double character: it is constituted by motor perturbations analogous to those seen in experiments upon animals; but, further, it is composed of disturbances, some sensitive, some sensorial, others circulatory or vaso-motor;

thus it is composed of hallucinations, sensorial or sensitive and motor, and of impulsions with motor terminal inhibition.

In man, the brain shows excitation, as well as the medulla oblongata and the cerebellum.

I.

ATTENTION DURING THE ACCESS.

The patient must be protected from falling; should not be alone out-doors; noise of carriages in the streets would bring it on; indeed, cases of fracture from falling are not rare, where there is a surprise.

The patient is conscious of his condition, and the aura will serve to warn him.

The vomiting should be foreseen, and the patient protected; if the demi-syncopal condition is imminent, some swallows of chloroformed water and of orange flower water, several drops of ether, or of nitrite of amyl placed under the nose, fresh water upon the face are the first attentions to bestow.

When the crisis persists or returns, if the vomiting continues, use Riviere's potion, a little ice or iced champagne, then put the patient to bed and let him rest.

Vertigo, with loss of consciousness and convulsive symptoms, are peculiar to otorrhoeics; the loss of consciousness may cause neglect of the examination and suggest epilepsy, but there is oftenest demi-syncöpe; the course is rapid, and the reason returns quickly, though the titubation (staggering gait), persists.

Labyrinthine vertigo is oftenest secondary to maladies of the ear and of the petrous bone; these cause an abnormal sensibility of the nervous portion of the organ, a hyperaesthesia more or less accentuated, and a consecutive hyperexcitability. Thus the reflexes, whose centre is the ear, are excited in a manner to cause irresistible impulses, or, on the contrary, extreme crisis by inhibition.

The phenomena develop with rapidity, and the inevitability of a reflex. This morbid sensibility of the internal ear is the condition itself of the production and return of the attack, the point of departure of the abnormal reflexes and the labyrinth hyperaesthesia.

The hyperaesthesia may persist, the otitic malady being cured, forgotten or quieted, it is sufficient to maintain the vertiginous condition permanently. It may be maintained also by a general neuropathic condition, by reflex action, or by the influence of lesions of distant organs.

The permanence of the causes of irritation of the labyrinth provoke, with time, persisting condition of nervous excitability which extends from the ear to the general nervous system, and dominates it. I have called this neurosis, "labyrinthism," analogous to that called meningism, symptomatic forms which often accompany ear affections and simple functional nervous disorders, without lesion.

This pathogenesis furnishes the most useful therapeutic indications.

Let us recollect that the fluid included in the osseous cavities of the internal ear, in which the nervous extremities of the acoustic are bathed, transmits to them all the shocks, pressures, vibrations from the surrounding mediums, and from bodies in contact, and of the muscular actions of accommodation. In this contracted space all augmentation of intra-labyrinthitic tension is sharply felt; if there is hyperaesthesia, the effect is immediately excessive; it is like a traumatic shock.

It is thus understood that the exaggeration of physiological movements which take place in the middle ear and are transmitted to the foot-plate of the stirrup, may be the cause of a sudden irritation of the labyrinth, of an abnormal compression passing or lasting, sufficient to provoke the reflexes of dis-equilibrium and others characteristic of vertigo, without, however, the internal ear suffering any lesion; the ear reacts abnormally to an excitation of an unusual shocking intensity; this is the case in many traumatic disturbances.

II.

TREATMENT OF VERTIGO BY CONCUSSION AND BY COMPRESSION IN MIDDLE EAR AFFECTIONS.

The diseases of the tympanum, upon which I have not enlarged, produce the greater number of the lesions which render possible, and even easy, the concussion or the compression of the labyrinthine nerve.

The most common anatomico-pathologic conditions in such cases, constituting the predisposition to vertiginous accidents, are softening with retraction (*voussure*) of the tympanum, polyps of the tympanum or canal, retentions of intra-tympanic exudations, ankylosis of the ossicles, adhesion (*sondure*) of the stapes, or the obliteration of the round window, tubular obstruction, etc. In these morbid conditions, the slightest vascu-

lar congestion, reflex spasm of the tensor (pain), the action of chewing, or blowing the nose, insufflation of air by the tube, centripetal pressure, rarefaction, etc., may determine the appearance of the subjective vertiginous sensations and the motor perturbations so well known.

The treatment of these lesions tend to relieve, to free the labyrinth by artificial aeration of the tympanum, and by rarefaction, as a means of re-establishing the normal tensions and the unstable equilibrium of all the transmitting apparatus to which the labyrinth is tributary.

Conservation of the elastic properties of the tissues should be looked to, that the return of the original mobility of the ossicles and membranes may be assured.

Certain affections leave after them incurable alterations of the parts; then the surgical indication consists in disengaging the oval and round windows, in removing the membrana tympani and ossicles if need be, cutting the tendons of the stapedius, and of the tensor, cutting the accessible adhesences to and mobilizing the stirrup which is bound in the sclerosis.

All the well-known classical methods in the pathogenic therapeutics of the middle ear diseases should be used. It is not necessary to enumerate them.

I will add that symptomatic therapeutics should never be forgotten. This will be referred to later.

The concussion of the labyrinth is sometimes traumatic, and is added to degeneration of the middle ear more or less extensive. The removal of the clots (coagulum), the correcting of the retracted tympanic membrane by the air douche or rarefaction, and sometimes with the fine bent probe working upon the handle of the malleus, frees at once the internal ear, whose two windows are compressed. Local blood-letting is sometimes useful in the first days following the shock.

If the labyrinth has been already affected with hyperaesthesia, the vertiginous symptoms are much more intense, out of proportion to the traumatism. Quieting the erethism is then indicated, either by quinine or the cold douche.

III.

TREATMENT OF VERTIGO CONNECTED WITH LABYRINTHINE HEMORRHAGE.

The pathogenic lesions of vertigo are not always extra labyrinthine. The internal ear is susceptible of being altered by divers morbid intra-labyrinthitic processes. These are

primary or secondary to affections of the tympanum or petrous bone, or of the meninges and the encephalon.

In this latter case, the symptomatology causes not a little confusion, and it is often difficult to limit to the labyrinth a lesion whose symptomatic expression is absolutely cerebral or mental.

Among the intra-labyrinthitic lesions, labyrinthine hemorrhage is first presented.

One recognizes the picture: sudden deafness and vertigo; whistling noise, absolute deafness in a few hours or days, by inundation of the labyrinth by extravasated blood. This coincidence of grave deafness with the vertiginous phenomena with, perhaps, even falling, shows that it is in the labyrinthine cavity that the lesion is produced, the drum of the tympanum remaining unharmed as there only the two sensorial and excito-motor branches are struck with the same blow.

The suppression of an habitual hemorrhage, or the possibility of the return of these critical flows, at the time of the menopause, should strictly indicate a milk diet and drastics.

Some hypodermic injections of ergotine, during 5-8 days, will also arrest the flowing processes. In the arterio-sclerous, milk and laxatives would have greater action.

If it is a secondary process complicated with albuminuria, a cachectic condition or toxaemia, the indication is for milk alone.

Local treatment of deafness with vertigo due to labyrinthine hemorrhage is generally abandoned. However, if one is guided by the effect of topical treatment, when it exists at the same time with auricular lesions, objectively accessible, which invite intervention, one may be less reserved in active hemorrhage of the labyrinth.

I think more energetic local therapeutics should be advised in this affection so serious to hearing; thus, I think well, from the beginning of the attack, especially in a plethoric person, to incise the membrana tympani largely, to aerate the tympanum, and to repeat, later, frequent applications of the actual cautery [ponites de feu] upon the mastoid region and the nape of the neck, or of fly blisters.

The hemorrhagic period past, it remains to hasten resolution.

Pilocarpine in hypodermic injections with the iodides and even the mercurials hasten resolution; two months of treatment are necessary.

The vertigo is thus lessened, then it disappears; but the de-

struction of the specific auditory cellules leaves a deafness, too often incurable, happily unilateral.

In the most fortunate cases, the deafness remains incomplete, but sometimes vertigo persists, or a great pre-disposition to the recurrence of a permanent condition of dizziness and titubation, which requires treatment. Sulphate of quinine is then resorted to, after the irritability of the acoustic nerve has been reduced by the continued current, by chloral, bromide of potassium, etc.

When a gouty crisis is to be considered, colchicum, Lavilles fluid, for example, is indicated and should not be forgotten. Charcot approves salicylate of soda. In albuminuric or cardiac cases, the treatment is entirely different.

IV.

TREATMENT OF VERTIGO COMPLICATED WITH LABYRINTH CONGESTION.

Our divisions are based upon an oftentimes delicate diagnosis. An intense congestion of the internal ear and a hemorrhage are difficult to differentiate otherwise than by the progress of the disease. The same therapeutics in such cases should be employed.

But there are many shades and degrees in the congestion and in its effects: remember that the osseous cavity where the acoustic nerve lodges, or better, its peripheric extremities, is inextensible; the windows yield first, then all is compromised. Whether this happens suddenly, momentarily, intermittently or permanently, the vertigo and other auditory subjective or motor disturbances finally appear, the provoked nerve reacts; the sensorial, by subjective noises, the excito-motor, by disturbance of the equilibrium; both by sensitive and sensorial crisis, by shock, vomitings, cold sweats, dis-equilibrium, semi-syncope, total inhibition, and fall without loss of consciousness.

The labyrinth, becomes a closed cavity by sclerosis, and ankylosis of its windows, constitutes then a veritable manometer of the vascular tension, either general or intra-cranial; thus, do not be surprised to find the vertigo an ordinary and preliminary symptom of intra-cranial affections, maladies of the kidneys, heart, uterus, lungs, the great vessels, of febrile conditions somewhat intense, of congestions of the head, neck, nasal fossae and of the throat.

Cold, a heat stroke, insolation, act in the same manner, even upon the healthy organ; it is a question of degree.

These congestions with vertigo often announce the return of old otorrhoeae, manifestations of syphilis infections, or diathetic maladies.

Active congestions are the most frequent and are treated as acute inflammation, as they are an extension to the labyrinth of the process which has invaded the tympanic cavity.

The unity of the general sensitive innervation, doubtless, explains the apparition of vertigo in affections of the external parts of the organ, external auditory canal, Eustachian tube, mastoid cells.

Finally, recall that the distribution of the internal auditory is limited to the labyrinth (Hyrtl, Henle), and that the arterio-sclerous lesions of the basilar (syphilis), sensibly modify the circulation to the extent of explaining certain passing failures of audition, comparable to intermittent paralysis.

By its endolymphatic circulation the labyrinth is, moreover, subjected to influence from the variation of intra-cranial tension; and auricular vertigo arises in this connection in these pathological cases.

These passive congestions, due to disturbances of the circulation, should be treated by ordinary means, taking account of the anatomo-pathological state of the concomitant ear.

Certain subjects are tormented by relapses or the persistence of these congestive vertigos; we will treat of this in the chapter upon the reflex origin of vertigo.

Sulphate of quinine is the medicament par excellence in these conditions; anaesthetic and anti-congestive, it fulfills two chief indications, and succeeds perfectly.

The arsenical preparations are very useful; the bromides are of great value as agents of vaso-motor constriction.

In gouty subjects, colchicum is employed with success, either during a crisis, or as a preventive. Plethoric subjects should avoid warm baths and vapor baths; exciting waters, sulphurous or thermal, are also prohibited.

Electricity applied to the great cervical sympathetic has been recommended, and many authors declare in favor of the continuous current.

Cold douches are applicable only to passive congestions complicated with nervous debility.

V.

TREATMENT OF VERTIGO CAUSED BY ANAEMIA OF THE LABYRINTH.

The symptomatic trilogy of labyrinthine affections, vertigo, subjective noises and deafness, are also observed in the anaemic condition of the internal ear; in syncope, the preludes are auricular.

With deaf patients, flooding, diarrhoea, maladies from lack of general nutrition, cause an anaemia which increases the deafness and renders it total if it was partial.

The effect is perceptible when a single ear is affected; it is only ostensibly manifested for the patient on that side.

Repeated pregnancies, prolonged lactation, convalescences from grave or protracted illnesses, albuminuria, cachectic affections, and those of the heart at the period of hypotension, are causes of labyrinthitic vertiginous troubles, as the increase of noises in the ear and the concomitant progressive weakening of hearing sufficiently demonstrate.

In arterio-sclerosis, senility, diabetes, with rapid denutrition, profuse hemorrhages, exhaustion from toxæmias, paludal infections, etc., one meets patients who have vertigo; much more serious and persistent if a sclerous otitic lesion produces local irritation.

In all these conditions of weakening of the circulation, of the innervation and of the nutrition, the labyrinth easily becomes hyperaesthetic; one finds painful hearing, otalgia, sensorial excitation, irritating noises, and the labyrinthine pathogenesis becomes most acceptable.

The latter is then much ameliorated by the reconstructives, iron, the glycerophosphates, a tonic regimen, repose, a sojourn in the country; otherwise by a milk diet and the iodides, if there exists arterio-sclerosis, or a cardiac affection.

In the latter case, it will be useful to add to the milk diet several drops of strophanthus, or several spoonfuls of syrup of sparteine, or of caffeine, alternating with fluid extract of kola.

The treatment is especially pathogenic, and succeeds very well when the indication is fulfilled; all acoustic hyperaesthesia is reduced; vertigo and noises diminish or cease rapidly with the general relief, and the audition improves at the same time, the otitic lesion permitting.

However, in spite of the existence of sclerosis with immobile ankylosis, these ameliorations may still be observed by a general logical treatment.

VI.

TREATMENT OF VERTIGO FROM LABYRINTHITIS.

Secondary to infectious processes general or neighboring, or to a traumatism of the base of the cranium, the inflammation of the internal ear disappears in an insidious symptomatology totally meningitic; very difficult to recognize, it remains beyond the resources of art. It is the same as primary labyrinthitis, often bilateral, called Voltolini's Disease; the symptoms, however, being distinct: fever, delirium, vertigo, deafness and paresis of the inferior members: cure with persistent deafness.

Hereditary syphilis, as well as acquired, often impresses the labyrinth rapidly, and the intensive specific treatment should be tried in these cases of serious deafness, of sudden evolution with or without meningismus, and vertigo.

Again, if in a case of apparent acute process of meningitic appearance, I would not hesitate to perform paracentesis of both drumheads and prescribe calomel and the revulsives, as if the affection were seated in the middle ear. Later, I would advise the waters of Mont. Dore, Lamalou, Aulers, or Brides, and the local application long continued, of static electricity, or the continued current. Pilocarpine injections have been tried for several years, and experience has shown that the treatment must be applied in the beginning to effect good results.

Valerianate of ammonium is spoken of, also iodides, with which we overwhelm deaf patients; bromides, which calm the vertigo; strychnine, much recommended in certain subjects; the neurasthenic action of arsenic is not to be despised; but the inflammatory lesions of the labyrinth leave little to be reconstructed.

Sulphate of quinine is still the greatest resource in persistent vertigo following these diseases of the internal ear, either primary or secondary.

As to surgical intervention upon the labyrinth, trephining of the promontory and ablation of the stapes, it is necessary to wait for complete and explanatory observations from the operators before judging.

For my part, in these affections of the internal ear, I find the clearest contra-indications to any *manu armata* intervention whatever.

It is only when the well-known clinical facts show the process to have developed from without inward, that is, that the laby-

rinthitic lesion is secondary, and may be judged as feeble in comparison to an evidently gross alteration of the tympanic cavity, near the windows, that active surgical means should be employed.

VII.

TREATMENT OF VERTIGO WITH LABYRINTHINE HYPERAESTHESIA.

It is well known that a large number of ear diseases leave in their train an abnormal sensibility to noise, painful hearing, sensitiveness of hearing, aversion to noise, even music, perhaps, which annoy the patient, paralyzing the function provoking fatigue and cerebral exhaustion, which may go so far as complete intellectual incapacity, showing at the same time motor disturbances of various extent, intensity and duration.

Mental, static, and motor troubles strike the patient in his periods of activity; and the constant menace of vertigo, the persistence of titubation and dizziness, create a condition of emotion and anxiety, which render his condition most painful.

The initial otitic affection is oftenest misunderstood or forgotten; and the vertiginous affection considered primary, its nervous appearance causes it to be classed among the neuropathies, *neuraesthesias*, etc.

Upon attentive examination of the organ, an old lesion is frequently found, sclerosis, with or without adhesions, *synechiae*, ankylosis, sometimes caries, dating from infancy, fortuitously reawakened, then the corresponding topical classical treatment may put all in good permanent condition.

But the symptomatic medication par excellence, which in no wise excludes the pathogenic treatment, is that of quinine sulphate. It should be given, by Charcot's method, persistently, by series of ten days, separated by rest, 0.60 centigrams daily, gradually raised to 1 gramme as renewed. Complaints and recriminations of the patient need not be considered.

As to the fear of rendering the patient deaf, the healthy ear is not affected by the treatment.

Quinine sulphate certainly acts as anaesthetic and anti-congestive, as Laborde's experience shows.

The diseased sensibility of the labyrinth provokes reflex spasms of the tympanic tensors, and the disturbance is redoubled.

The anodynes quiet also the vertiginous crises arising from general and sensorial hyperaesthesia; antipyrine has also that value.

After otitis from grippe, which has left the convalescent in a remarkably neuropaesthetic condition, labyrinthine hyperaesthesia is shown at its maximum of gravity, and complicates by ricochet (reflex?). Cerebral and motor incapacity, painful hearing, deafness and malaise, increased by noises, dullness, maddening subjective noises, etc., are rapidly ameliorated by quinine treatment in the beginning; paracentesis of the tympanum may be rightly added, followed by immediate general relief. Quinine, air douche, tympanic paracentesis, are the three imperative indications in such cases. Often, even in the absence of the actual local process, I prescribe a local anodyne, instillations of atropine, solution of morphine and of cocaine, and sometimes a draught of codeine and tincture of aconite in the evening.

During convalescence, the hyperaesthetic vertigo yields to cold douches, when it is permanent or a relapse. Tonic regimen and medication, a sojourn in the country, an open-air life, and total rest are all recommended.

If the patient has no trace of otitic lesion, the treatment by quinine sulphate is first imposed, cold douches afterward. The vertigo, when complicated with hysteria or neuropaesthesia, may be combated and ameliorated by this means.

Vertigo sometimes recurs periodically in subjects afflicted with serious traumatism of the cranium. Some leeches upon the arms or upon the mastoid process would be indicated in general, as there are otitic pains.

Odontalgia, neuralgia of the fifth pair, may provoke otalgia, painful hearing, noises and vertigo by otic hyperaesthesia, without appreciable lesion or transient congestion; quinine sulphate being still the useful remedy. Aconitine may be associated with it if there exists a rebellious concomitant congestive element.

Migraine, a vertiginous affection, is frequently transformed by age into Meniere's vertigo, with somewhat regular crisis, followed by progressive deafness, with intense tingling.

Under this mask are surreptitiously developed the gravest sclerous auricular lesions. The bromides and iodides are then indicated, and arsenic is very useful if sulphate of quinine is not satisfactory.

Vertigo of tabes is variable and tenacious; it exists with or without trophic otitic lesions; often the vertigo may be provoked by pressure; it resists all and outlasts all medications. I have seen it precede twelve years of shooting pains and the characteristic process.

TREATMENT OF LABYRINTHINE VERTIGO IN TOXAEMIA.

This chapter is addressed only to specialists who are consulted only for a persistent disease, and if the salient auditory troubles show the same centre as the vertiginous reflex, they are apparently of meningitic origin.

The appearance of vertigo by crises, at the beginning of infectious fevers, or during their course, should cause examination of both ears, especially in infants. The same in the course or defervescence of mumps, in adults.

The same in the course of pneumonia or acute quinsy, either primary or secondary lesions, the crises of fear, sub-delirium with vertigo, with terrific hallucinations, oscillations of the head, fear of movement, twisting the neck, clinging to persons or objects, etc., should immediately suggest otitic labyrinthine complication.

In otorrhoea, the same conclusion follows as soon as these phenomena are added to ordinary signs, and if it is suppressed, it is because the infection invades the internal ear and menaces the meninges; if there is retention of pus, it is time to act.

We recognize vertigo from its pernicious paludic access. We have already spoken of that shown in albuminuria and ethylism, which is improved by the severe milk regimen and drastics. Again, there is vertigo in plumbic intoxication, with irritating noises, auditive hyperaesthesia and deafness more or less rapid, the stirrup free or fixed.

Gouty vertigo exists with or without lesion of the middle ear, and yields to specific treatment and to special regimen.

Tobacco, salicylate of soda, sulphate of quinine also provoke vertigo. Finally, vertigo is explained as caused by a bad state of the intestines, by intoxication; the indication is deduced from knowledge of the toxic causes.

TREATMENT OF REFLEX LAB. VERTIGO.

The internal ear is the point of departure of reflex motor phenomena, either for binauricular accommodation or for audition. In the morbid condition, its increased excitability exposes it to motor perturbations which may arise from the influence of separate diseased organs.

This is called reflex vertigo, and is very frequent. It is observed with or without lesions of the ear, objective or recognizable (sclerosis, ankylosis, etc.).

It is a precocious manifestation of lesions little evident at the beginning, which lead, however, after a period of erethism, to

sclerotic deafness, and it is then perceived solely when the vertiginous troubles announce a tardy lesion, or better, tardily recognizable, of the labyrinth and ear. According to the time and the dominant theory, the reflex labyrinthine vertigo is reported, as such or such affection of such and such an appearance. Since Trousseau, vertigo is declared of stomachic origin, and most of our sclerous arthritics are improved by Vichy, etc.

Since Charcot, it is admitted that vertigo is *neuraesthenic*, or connected with one of the cerebro-spinal affections.

Charcot, however, avoids these extreme systematizations; Meniere's vertigo is for him cerebellar, but he often pronounces the centre to be labyrinthine and auricular. It is clinically indisputable that affections of the stomach, dyspepsia and dilatation, exert an enormous influence upon the production and repetition of vertigo, and that relief is obtained by a milk and vegetable diet, etc., and by thermal cures of Vichy, Carlsbad and others.

Vertigo is often, also, the symptomatic expression of uterine, hemorrhoidal or pulmonary maladies, even of psychical conditions, etc.; many otitic scleroses develop simultaneously, also. In these conditions the labyrinth is excited as a feeble point of the organism upon which all is retained, the antecedent or existent lesions of the ear creating the predisposition.

Neuraesthesia, hysteria, nervous affections, illness from exhaustion, from great sorrow, prolonged suffering which cause *erethism* and increase irritability, are also the conditions of arousing the vertiginous crises, even in the absence of any predisposing otitic lesion.

The labyrinth rings, sings, is unbalanced and dull; as the eye, in the same case, is disturbed, sees sparks and flames and suffers passing blindness; as the heart has palpitations and syncope by the distant action of a diseased or suffering organ, they are morbid sympathies.

It is to this organ that care should be immediately addressed at the same time that the quinine treatment quiets the hyperexcitability of the internal ear and the cold douches fortify the central nervous system. The bromides are useful aids in quieting the reflex excitability. These reflex manifestations are frequently followed, sooner or later, by trophic alterations of the auditory organ, of a slow but gradual sclerosis, which leads to final total deafness, tardy demonstration of the labyrinthine origin of the disturbance.

Attacks of migraine, facial neuralgia, access of gout or of hepatic colic, nephritis, intense or continued pain, cause vertigo, and the habitual deafness is observed in its train.

Experiment only shows that trophic lesions may be caused in the ear whenever injury is done to the trigeminal nerves, the great sympathetic, the pneumogastric, or the bulb (restiform body).

REFLEX INFLUENCE OF THE ORGAN OF HEARING UPON THE MOTOR APPARATUS OF THE EYE.

By V. URBANTSCHITSCH (Wien. Klin. Woch., No. 1, 1896).

Translated by H. A. Alderton, M. D., Brooklyn.

The eye reacts to excitations from the ear oftenest under the form of nystagmus, generally oscillatory, rarely rotatory. In a case of the author's, feeble excitation of the cavity of the tympanum provoked oscillatory nystagmus which became rotatory when the excitation was more lively. The forced abduction of the eyes from the side of the healthy ear often favors the appearance of nystagmus; the author has, however, observed the contrary case, the nystagmus in the eyes deviating wildly toward the healthy ear, and at the same time vertigo combined with nystagmus.

The slightest excitations suffice to provoke the ocular reflex, but it is especially bathing with fresh water that produces it, as it also easily the cause of the vertigo.

In a young man seen by the author, the bilateral nystagmus supervened spontaneously, joined to cholesteatoma of the middle ear; every touch produced a violent attack of vertigo and of nystagmus, which diminished after ablation of the cholesteatoma. In another case the nystagmus out-lasting a very intense acute otitis media caused by a foreign body and rapidly cured. The nystagmus persisted for ten years. This is exceptional, as the reflex nystagmus is habitually transitory, lasting a few seconds only, and is sometimes but a single shock.

The rapidity of the convulsive movement of the eye depends upon the nature and duration of the excitation. Thus with polyps of the tympanum, sharp pressure upon the polyp leads to an oscillatory nystagmus of sudden shocks and short duration. Slight and continued pressure provokes a slow movement of the pupils toward the diseased ear, followed by a sudden return to the middle position, these movements lasting

while the pressure continues. After ablation of the polyps, these phenomena disappear and are not provoked by pressure upon the point of implantation of the polyp near the labyrinth wall. The author has seen, at different times, the nystagmus provoked by an auditory impression by certain determined sounds. Nystagmus of auricular origin is often feeble and needs to be investigated, as it is not rare.

Strabismus, on the contrary, is of reflex origin; the author has observed two cases: the first in a child of six years having otitis media for two years, with strabismus converging to the same side, which augmented or diminished from day to day according as the child suffered more or less with the ear. The otitis cured, the strabismus remained though weakened. The second case is that of a woman who developed a slight divergent strabismus in the course of an otitis caused by polyp. At the time of the ablation of the polyp the deviation of the eye augmented notably and persisted in the same degree for several months afterward.

One case of paralysis of the large oblique muscle has been observed (Moos) and two cases of pupillary reflex of auricular origin (Moos, Gelle).

RESULT OF AUTOPSY IN A CASE OF MENIERE'S DISEASE. (LEUCEMIA).

BY ALT AND PINELES.

Translated by H. A. Alderton, M. D., from the *Annales des mal. de l'oreille*, &c.

Laborer, 66, having never had any serious illness up to the winter of 1894, began to complain seriously of pain in the head, of feebleness and fatigue. In June 1895, violent vertigo and buzzing in the ear caused him to fall in syncope, and upon recovering consciousness, he had become almost totally deaf, and fourteen days afterward, totally so. He remained in bed, had frequent attacks of vertigo, and entered the hospital in July 1895.

An acute chronic myelo-genic leucemia was diagnosticated (2,600,000 red blood corpuscles to 600,005 white, about 1 to 4, numerous large mononuclear leucocytes, medullary cellules by the side of lymphocytes, isolated red corpuscles containing a nucleus, enormous tumefaction of the spleen, very large liver, extensive hematoma). Examination of the ear; great bilateral retraction of the disturbed membrana tympani, absence of light reflex. The fork C^2 on vertex is not perceived external behind the left ear, and upon the mastoid process only the C^2 , C^1 and C are heard. The right ear perceives only the C^2 , C^1 and C for a short time and by bone conduction. The spoken voice is heard only in the immediate neighborhood of the right ear, complete deafness on left. Currents of 15 to 20 M. A. do not produce vertigo.

Death, September 8, 1896; autopsy, myelo-genic leucemia with suppurated leucemic hematomas. Both temporals and the crura cerebri [trunc] have been removed for examination.

The crura cerebri [trunc] and the acoustic nerve, treated by the Weigert-Pal method, present the following modifications: in the intra-medullary passage of the acoustic, as well as in the

lateral and median roots of the acoustic, were seen in several places, infiltrations of small leucemic cells more or less important. The point of exit of the acoustic where the two roots collide, is much infiltrated, the pia-mater slightly thickened and infiltrated. The acoustic fibres are somewhat degenerated. The acoustic center, the region of the corpora quadrigemina, [quadrijumeaux] and the cerebellum are not pathologically modified. No trace of hemorrhage.

Middle ear intact. Exam. of the labyrinth (Dr. Kaufman), negative (controlled by Gruber, Politzer and Weichselbaum); the leucemic modifications described in the labyrinth are not appreciable and are concealed by the calcification of the part. In the cases observed up to the present, the modifications affected either the labyrinth (Politzer, Steinbrugge, 2 cases, Lannois, Wagenhauser) or the middle ear (Gradenigo). Modifications of the acoustic are nowhere mentioned, probably because the crura cerebri [trunc] has not been examined. In this case leucemic infiltration of the acoustic is first recognized.

As the literature contains no case of isolated affection of the acoustic having provoked Meniere's disease, we may consider this observation as the first. The fact that the current of 15 to 20 M. A. produced no vertigo in the patient, may, according to Pollak, be attributed to lesions of the co-ordinating apparatus.

DISCUSSION.

Gruber observed that the numerous preparations shown by the author gave no trace of the organ of Corti. Gruber, in numerous specimens that he has examined, where the labyrinth was developed, has always recognized the organ of Corti under the microscope. But in these preparations it seems as if cut away, and nothing is distinguished, while the anomalies of the labyrinth are visible. Gruber believed that the calcification destroyed the organ, and the inflammation did not attack only the acoustic but also the labyrinth. The labyrinthine examination is very interesting.

Alt attaches the greatest importance to the leucemic infiltration of the acoustic, and has only observed its influence upon Meniere's disease secondarily.

ABSTRACTS FROM CURRENT ENGLISH AND
AMERICAN OTOLOGICAL LITERATURE.

BY T. MELVILLE HARDIE, M. D.,
OF CHICAGO.

THE INFLUENCE OF DEAFNESS UPON THE DEVELOPMENT OF THE
CHILD.

Alderton.—The influence of deafness upon the development of the child. *The Laryngoscope*, August, 1896.

Impairment of hearing disadvantageously influences the development of the child primarily in two ways: first, through a curtailment of the field of observation; second, through a limitation of the possibility of instruction. The child is considered inattentive, then dull and absent-minded. Teachers and parents after a time let things take their own course, and the habit of mental and physical inaction is gradually formed, with disastrous results to the child's mind, character and physique. Alderton thinks that there should be compulsory periodical examinations of school children for the discovery of such defects as poor eyesight and difficulty of hearing, and that the parents of afflicted children be advised to place them under competent care; further, that the local board of education should form special classes for the instruction of such handicapped children by teachers trained especially for this purpose.

A CASE OF BRAIN ABSCESS SECONDARY TO CHRONIC SUPPURATIVE
OTITIS MEDIA.

Bacon—A case of brain abscess secondary to chronic suppurative otitis media, and presenting unusual symptoms. *New York Medical Journal*, August 15, 1896.

The patient, aged 32, had had chronic purulent otitis media for 15 years, and had recently acted somewhat strangely. On December 5th, after four days of severe pain in the left ear, accompanied by profuse discharge, he had a general convulsion, lasting twenty minutes, with unconsciousness during the convulsion, and for half an hour afterward. The mastoid antrum was opened; the lateral sinus was injured, on account of its unusual position, and plugged with gauze; left facial paralysis. Decem-

ber 9th. Patient had a severe chill, lasting fifteen minutes, followed by profuse perspiration; is markedly aphasic. December 11th. Second operation. Lateral sinus exposed; pulsating; a hypodermic needle inserted into it withdrew blood. The original mastoid incision was carried an inch and a half upward, and a horizontal incision was made forward for the same distance. A button of bone three-quarters of an inch in diameter was removed with a trephine, the center pin of which was placed two inches above the center of the external meatus. The dura was exposed and found slightly bulging and pulsating, and the opening in the skull was enlarged with a rongeur forceps downwards and backwards. In separating the thickened dura from the tympanic roof pus exuded. An opening in the dura was found with a probe, and one-half an ounce of pus escaped. A Y-shaped incision was made in the dura, the little finger introduced in an inward, upward and backward direction, when a large abscess cavity, containing one and a half ounces of offensive pus and broken-down brain tissue was found. The bridge of bone connecting the trephine opening and the antrum was removed and the external wound irrigated. The abscess cavity was not washed out, but loosely packed with iodoform gauze, and the wound packed and bandaged. The abscess cavity was repacked December 13, and on this and the following day the patient had six convulsions. After this the patient slowly, but steadily, improved, Dr. Bacon introducing his little finger into the wound each day, to be sure that it was filling up from the bottom.

January 29, 1896. Steady improvement in all symptoms; the aphasia has practically disappeared; the constant current is applied to the face daily. Patient left hospital.

June 1st. Still a small sinus over the antrum, and some discharge of pus from the external meatus. The facial paralysis is disappearing.

ACUTE SUPPURATIVE INFLAMMATION OF THE MIDDLE EAR—ACUTE SUPPURATIVE MASTOIDITIS—ABSCESS OF THE NECK—OPERATION.

Bishop.—Acute suppurative inflammation of the middle ear; acute suppurative mastoiditis; abscess of the neck; operation. The Laryngoscope, September, 1896.

The article is a report of a clinical lecture delivered at the Post-Graduate Medical School, of Chicago.

The author described his useful mastoid ice-bag, and at the same time properly insists upon the necessary vigilance on the part of the surgeon, which must follow its application. He also impressed upon his hearers the necessity of conscientious prepa-

ration for mastoid operations through frequent and careful work on the cadaver.

BRAIN TUMORS, OTITIC BRAIN ABSCESSES AND AURAL VERTIGO.

Burnett.—Brain tumors, otitic brain abscesses and aural vertigo. Univ. Med. Magazine, March, 1896.

In this paper, read in the discussion on "Intra-cranial Tumors," tympanic origin (sometimes erroneously called Meniere's disease), and a brain tumor, it must be borne in mind that in ear vertigo there are always found deafness and tinnitus, with objective symptoms of chronic catarrh of the middle ear, and at times a demonstrable ankylosis of the malleus and other ossicles. The vertigo is nearly always paroxysmal, excepting in very chronic cases, when there may be a constant disturbance in equilibrium. However, there is an entire absence of severe headache and parietic symptoms even in the worst forms of ear-vertigo.

In making a differential diagnosis between aural vertigo, of tympanic origin (sometimes erroneously called Meniere's disease), and a brain tumor, it must be borne in mind that in ear vertigo there are always found deafness and tinnitus, with objective symptoms of chronic catarrh of the middle ear, and at times a demonstrable ankylosis of the malleus and other ossicles. The vertigo is nearly always paroxysmal, excepting in very chronic cases, when there may be a constant disturbance in equilibrium. However, there is an entire absence of severe headache and parietic symptoms, even in the worst forms of ear-vertigo.

In brain tumors, even if there be co-incident tinnitus and deafness, the vertiginous tendency is constant and the headache is continuous and severe, parietic symptoms set in soon, and increase in severity, and double neuritis at last makes its appearance, especially if the lesion is in the region of the cerebellum, or at any point interfering with the circulation of the cavernous sinuses and ophthalmic veins. If the vertigo is shown to be of tympanic origin, and therefore due to retraction and ankylosis of the ossicles, with consequent impraction of the stapes in the oval window, and reflex irritation of the cerebellum, liberation of the stapes by surgical removal of the incus, the membrana and malleus being left in position, will permanently relieve the aural vertigo in most cases. This conclusion is based upon twenty-three such operations within the last eight years.

THE INDICATIONS FOR PERFORATING THE MASTOID IN ACUTE AND SUB-ACUTE MIDDLE-EAR INFLAMMATIONS.

Cohn.—The indications for perforating the mastoid in acute and sub-acute middle-ear inflammations, *New York Medical Journ.*, Aug. 8, 1896.

No one symptom should be depended upon, but the symptomatology of each case carefully considered. The causes which produce conditions requiring operative interference have not yet been fully determined, but we may assume that a maximum of congestion, primary and secondary microbic invasion, and the morphological and anatomical conditions of the mastoid itself are the etiological factors. Congestive conditions frequently recover without operative interference; sensitiveness of the mastoid occasionally persists for some time, in influenza otitis for several weeks, without requiring operative interference. If however, it does not disappear and is accompanied by redness and oedema, it points in the absence of severe external otitis to periosteitis, or osteitis. A differential diagnosis between these two conditions should be made where possible. After discussing somewhat in detail the appearance of the drum head, the character and quantity of the discharge, and the temperature, the writer formulates his indications for operation as follows:

The presence of hyperaemia and congestion alone is no indication for opening the mastoid.

The mastoid should be opened in all cases of diagnosed osteitis, if under the usual antiphlogistic treatment the inflammation shows no tendency to resolution.

In pronounced cases of antral empyema, in which the character of the discharge is purulent and the empyema shows no tendency to discharge completely through the middle ear.

In all cases of protracted otitis, with profuse otorrhoea, which show no tendency to resolve within a reasonable period, the time chosen for operation depending upon the manifest symptoms, whether, for instance, retention is present or the mastoid bone itself is involved.

In every case of acute otitis in which there are dangerous symptoms of resorption, and in which the drainage cannot be established by paracentesis or by natural perforation. In those cases, even without manifest symptoms of mastoid affection, the mastoid should be opened, in order to produce a more favorable drainage and enable a thorough cleansing of the middle ear.

In all cases of muco-purulent otitis, in which the otitis is evidently maintained by mastoid involvement, the time for opera-

tion depending upon the condition of the patient and the presence or absence of symptoms pointing to retention, or other complications of a serious nature.

In cases of mastoid disease, or otitis, complicated by lymphangitis or lymphadenitis, in which there is an imminent danger of the formation of abscess, and in those cases in which the lymphadenitis does not tend to resolve under ordinary antiphlogistic treatment.

In cases of protracted otitis in which there are symptoms of serious secondary complications, involving danger of extension of the inflammation inward toward the brain, or downward toward the neck.

In cases of acute otitis in which complicating stenosis of the external canal prevents drainage and thorough cleansing of the middle ear.

TRAUMATIC RUPTURE OF THE MEMBRANA TYMPANI.

Fetterolf.—Traumatic rupture of the membrana tympani. Univ. Med. Magazine, May, 1896.

The writer discusses the causation and treatment of the accident and reports two cases. The accident does not occur to the normal drumhead; a condition of thickening associated with calcareous deposits predisposes to it. A second predisposing cause is eustachian stenosis. Treatment: If seen within a few hours after the injury and while blood is flowing from the ear, the meatus should be gently cleansed with a stream of carbolized water as hot as can be comfortably borne. After the bleeding has been checked and the parts rendered surgically clean, an aseptic speculum should be introduced, the remaining clots removed with a dossil of sterilized cotton and the exact location and condition of the tear determined. Should the injury be simply a puncture or linear tear, a delicate film of boric acid or acetanilide, which is more markedly antiseptic, is insufflated. A pad of sterilized cotton is placed over the ear and retained by gauze bandage. If a dry aseptic scab forms nothing further is done until at the end of three weeks, the ear can be gently cleansed.

If the wound consists of two converging lines, an attempt should be made to replace and retain the flap in the plane of the drumhead by using Blake's small paper disk. A disk of moderately stiff paper is cut out, fitted over the injured area and left untouched until the drumhead has healed. Should displacement occur, it should be repositied. In order not to detach the disk, the patient should blow the nose very gently during three or four days succeeding its application. Should the case be seen two or three days after the injury the treatment will vary. If

necessary, the meatus should be cleansed by instrumental means as far down as the fundus, using no solution, to avoid removing a firm scab. If, however, it appears angry or moist, it should be cleansed, dried with sterilized cotton and treated as an ordinary otorrhoea.

RAYNAUD'S DISEASE OF THE EARS.

Fordyce.—Raynaud's Disease of the Ears. *Jour. of Cutaneous and Genito-urinary Diseases*, March, 1896.

The patient, a male, aged 39, had gonorrhoea thirteen years ago, and syphilis (probably) eight years ago. His present trouble began in August, 1894, on a warm day. The ears became cold and blue and remained so for several hours. They then gradually resumed their normal color. Such attacks were frequent until January, 1895, when an area about half an inch in diameter and situated at the junction of the upper and middle thirds of the auricle assumed a permanent bluish-black color. This was accompanied by numbness, cold and burning pain at frequent intervals. The part affected became gangrenous in March, 1895. It was dry, without odor or suppuration, and was easily removed by scraping. August 30th, he was seen again, when no trace of the disease was found, except superficial cicatrices. A similar case of Raynaud's disease of the fingers, toes and ears, in a 14-year-old boy, the subject of hereditary syphilis, was reported by Mr. Wherry (*Clinical Sketches*, August, 1895).

THE CLINICAL INVESTIGATION OF EAR DISEASES.

Grant.—The Clinical Investigation of Ear Diseases. *The Laryngoscope*, July, August and September, 1896.

This is practically a condensed treatise of thirty-one pages upon diseases of the ear, reprinted, after revision by the author, from the *Medical Annual*, London. "The course of investigation described is a somewhat modified and extended reproduction of that scheduled in the case papers employed at the Central London Throat and Ear Hospital."

REPORT OF A CASE OF OTITIC BRAIN ABSCESS.

Hubbell.—Report of a Case of Otitic Brain Abscess, with Remarks on Diagnosis. *Buffalo Medical Journal*, May, 1896.

The patient, aged 20, had had otorrhoea since he was six years of age. Had pain in the left ear and left-sided headache for two or three weeks, with loss of appetite, nausea, history of chilliness, with slight fever, and loss of sleep. "He soon showed the characteristic mental sluggishness and finally delirium, the chills, vomiting, dizziness, prostration, convulsions, and the normal slightly subnormal or moderately elevated temperature, the

slow, full pulse, slow respiration," characteristic of abscess. The patient was not operated upon.

The post-mortem examination showed a recent acute fibrinous lepto-meningitis, with moderately firm adhesion on the left side, between the temporo-sphenoidal lobe and the bone. Opposite these adhesions was a cavity, in the temporo-sphenoidal lobe, the size of a walnut, lined by grayish necrotic tissue and filled with pus. It connected with the middle ear, by two or three distinct openings, through the roof of the latter. The mastoid process was not involved.

Using the case as a text, Hubbell reviews the history of the operation; the frequency, results, and diagnosis of brain abscess in its initiatory, established and terminal stages. The diagnosis is made probable by:

1. The history of the case and of a preceding otorrhoea and ear trouble.

2. Those general symptoms pointing to inflammation in the cranial cavity, namely; headache, nausea, vomiting, chilliness or chills, moderate elevation of temperature.

3. Those general symptoms indicating suppuration: headache, chills, temperature a little elevated, nausea and sometimes vomiting, dizziness, optic neuritis, not always; followed by:

4. Those symptoms caused by pressure from accumulation of pus: mental sluggishness; temperature, not high; occasionally sub-normal; respiration less frequent; pulse slower (50 to 65); prostration; stupor; delirium.

5. Those localizing symptoms of temporo-sphenoidal abscess: Convulsions, if the cortical motor area is involved or pressed upon; aphasia, if the speech center is reached in the left frontal lobe; hemianopsia, if the occipital lobe becomes affected; hemiplegia (opposite side and generally partial), if the internal capsule of the brain is pressed upon or involved, or if the cortical motor centers are destroyed; paralysis of the third nerve of the affected side, if contiguous pressure and meningitis are sufficient.

6. Those localizing symptoms, if the abscess is cerebellar: Cerebellar inco-ordination, if there is pressure or involvement of the middle lobe of the cerebellum; persistent occipital pain in some cases.

The paper concludes with a useful bibliographical list.

EXTENSIVE NECROSIS OF THE PETRO-MASTOID FOLLOWING MIDDLE-EAR SUPPURATION.

Lederman.—Extensive Necrosis of the Petro-Mastoid following Middle-Ear Suppuration. *The Laryngoscope*, July, 1896.

A deaf mute, aged 62, with right facial paralysis of three months' standing, polypi; profuse and offensive discharge; pain

about the ear and at the top of the head; was treated for three weeks by removal of polypi and cleansing of the external meatus, when she was referred to Dr. Lederman for operation. The necrosis was found to be very extensive, and the entire mastoid portion was removed. Although the dura was exposed, the lateral sinus was not opened. The patient did well for nine days, when a small sinus was found on the inner wall of the cavity, which was curetted and packed with gauze. Seventeen days later there was a profuse hemorrhage from the mastoid through the ear and nose and mouth. Packing of the wound and tamponing of the naso-pharynx was resorted to. Bleeding recurred on the next day and was checked, but the patient died ten days later. Inability to move the left arm and leg had been noticed for two weeks before death. Post-mortem examination showed that the hemorrhage had resulted from ulceration of the lateral and inferior petrosal sinus. Softening of the lower portion of the right temporo-sphenoidal lobe was found. No fundus changes had been observed during the patient's illness.

SIMPLE AND EFFICIENT TREATMENT OF CHRONIC CATARRHAL DEAFNESS.

Randall.—Simple and Efficient Treatment of Chronic Catarrhal Deafness. Univ. Med. Magazine, July, 1896.

The writer is opposed to the "operative treatment" of the affection, and commends the following: The naso-pharynx is to be vigorously sprayed with a Dobell's solution, but the tube-mouths are to be "mopped" with a bent applicator, charged with glycerole of tannin, or of iodine. This is followed with an oil-spray of menthol-camphor, 1 per cent. to 2 per cent. for protective purposes. A good catheter is then used. One of three millimetres internal diameter, and thirteen centimetres length, made of pure silver, to secure full pliability, usually serves. The auscultation tube should be employed, and patient's statements as to the inflation disregarded. The direction of the lumen of the beak of the catheter must correspond with that of the eustachian tube. With the catheter in position, the menthol-camphor is freely sprayed up the tube. Careful massage with the pneumatic speculum of Seigle, or equivalent apparatus, should complete the procedure.

CONGENITAL FISTULAE OF THE AURICLE.

Roy.—Congenital Fistulae of the Auricle. The Laryngoscope, September, 1896.

Dr. Roy reports a case to show that such congenital fistulae are occasionally troublesome. A boy, aged 7, had repeated abscesses in the superficial cellular tissue, surrounding the fistula.

After ineffectual treatment by emptying and injection for some time, the whole fistulous tract and abscess cavity were thoroughly opened up, curetted, dressed daily and allowed to heal by granulation. The fistula on the other side gave no trouble.

TWO CASES OF ACUTE MASTOIDITIS IN PERSONS SUFFERING FROM DIABETES MELLITUS.

Sheppard.—Two Cases of Acute Mastoiditis in Persons Suffering from Diabetes Mellitus. *Medical News*, May 2, 1896.

The writer denies that there is an especial tendency to inflammations of the mastoid in diabetes, in view of the fact that but two of his one hundred and seventy-five cases have occurred in diabetics. He believes that such cases should be operated upon. In the first patient, three days after operation, infiltration occurred; first along the anterior border of the sterno-mastoid, and later extending around under the chin, down the sterno-mastoid muscle and over part of the sternum. This condition lasted for two weeks, and the patient very slowly recovered. In Case II, the ear affection developed three weeks before, during an attack of influenza. Operation was performed May 2, and as a result of his experience with Case I, Dr. Sheppard decided to dress the wound daily. No untoward symptoms until May 13, when erysipelas, at first not clearly recognizable, set in, and the patient succumbed June 5, to meningitis.

ON DISEASES OF THE NOSE AND NASOPHARYNX IN WHICH THE GALVANO-CAUTERY IS APPLICABLE.

Wilson —On diseases of the nose and nasopharynx in which the galvano-cautery is applicable; with a special bearing on turbinal hypertrophy as a cause of deafness, tinnitus, headache, etc. *Liverpool Medico-Chirurgical Journal*, July, 1896.

The writer holds very strongly to the opinion that in all cases of deafness and tinnitus, in persistent headache, vertigo, and in some cases of neuralgia, a thorough examination of the anterior and posterior nares should be made, inasmuch as deafness and tinnitus have, as commonly associated causes, antecedent rhinitis, with turbinal enlargement. The lesson therefore to be learnt by every aurist is that the nose must be regarded as an accessory organ to the ear, and that the examination and treatment of the former is indispensable whenever there is an affection of the latter.

THE IMPORTANCE OF EARLY DIAGNOSIS AND TREATMENT OF INFLAMMATION OF THE MIDDLE EAR.

Fruitnight.—The importance of early diagnosis and treatment of inflammation of the middle ear. *Medical News*, Sept. 12, 1896.

While one cannot agree in every particular with the treatment suggested, the paper will be of value if read by the phy-

sician who reassuringly informs the sufferer from purulent otitis that "it does not signify, it will take care of itself, just wash out the ear with a little warm water and borax and it will be all right."

HYGIENIC PRINCIPLES IN THE PREVENTION OF EAR DISEASES.

Fridenberg.—Hygienic principles in the prevention of ear diseases. *Med. News*, August 8, 1896.

The writer insists upon the importance of a "proper hygiene of the naso-pharynx, in health as well as in disease." In addition to the frequent use of the tooth-brush, the daily use of the pharyngeal douche is recommended. "A small amount, not a mouthful of fresh cold water should be used. The chin is now raised and the fluid allowed to run slowly back by its gravity, without any attempt at gargling. When the fluid reaches the lowest part of the pharynx, it causes a sudden brisk reflex contraction of the pharyngeal muscles, which, assisted by a forward inclination of the head is amply sufficient to empty the contents of the mouth."

Adenoid vegetations, the nasal douche, hypertrophic tonsils, the wearing of ear-rings, ear-spoons, foreign bodies in the meatus, ruptured drumhead, and surf-bathing are also discussed, but hardly with a text book's minuteness.

THE TELEPHONE AND ITS APPLICATION TO THE DEAF.

Thornton.—The telephone and its application to the deaf. *The Lancet*, August 15, 1896.

As medical officer of the Margate Deaf and Dumb Asylum, with the charge of 300 deaf mutes, Mr. Thornton experimented with a modified telephone to find out whether the instrument could be made of service in the education of the ten to twenty per cent. of deaf-mute children who are capable of hearing, with or without instrumental aid, vowels or words and sentences. The advantage of the telephone over the most approved form of ear trumpet is that it is possible for the children to hear with the mouth of the speaker six inches to a foot from the mouth-piece of the transmitter, and they have therefore a full view of his facial expression; and lip movements, and several children may be instructed at the same time, as the wires from several receivers can be coupled up to one transmitter. A case mentioned in illustration was that of a young woman with nerve deafness so extreme that it was necessary to speak at the top of one's voice within two or three inches of her ear to enable her to hear, but with the telephone Mr. Thornton was able to converse in a subdued voice with his mouth twenty-six inches away from the transmitter.

The instrument is manufactured by Maw, Son and Thompson, London.

DEAF-MUTISM AND GOITRE.

Pendred.—Deaf-mutism and goitre. *Lancet*, August 22, 1896.

The writer, records the association of deaf-mutism and goitre occurring in two members of a large family. In one woman, aged thirty-eight, the growth was first observed, after small-pox, when she was thirteen years old. In the second, aged twenty-eight, the tumor has been growing fifteen years. Both mumble incoherently and the older is imbecile.

AURAL REFLEXES.

Yearsley.—Aural reflexes. *The Medical Times and Hospital Gazette*, May 23, June 6, 1896.

After a discussion of the nervous connections of the external and middle ears, the author considers "ear cough," the cardiac, taste and gastric reflexes, epileptiform convulsions of aural origin, hiccough, and the reflex effects of ear disease on the oculo-motor apparatus. An unusual case of hiccough may be briefly mentioned: A sailor aged 35, had suffered from persistent and distressing hiccough occurring twice a minute and which had lasted for a week. Opium relieved it, but only for a time, on the ninth day after the first consultation attention was directed to the patient's ears on account of a slight dullness on the left side of the head. The drumhead was indrawn. Polarization caused the hiccough to immediately cease, and there was no return. Urbantschitsch (*Wien. Med. Wochenschr.*, Jan. 2, 1896), points out that the influence of the ear upon the oculo-motor apparatus most commonly manifests itself in the form of nystagmus (more frequently oscillatory than rotatory), more rarely in spasm or paralysis of the eye muscles and affection of the internal musculature.

NEW METHOD OF ADMINISTRATION OF BROMIDE OF ETHYL IN OTO-RHINOLOGY.

BY DR. VICTOR TEXIER (NANTES).

Translated and Abstracted from the *Annales des mal. de l'oreille*, etc., by H. A. Alderton, M. D., Brooklyn.

The accidents from the use of bromide of ethyl result from an excess of anaesthesia or too long a duration of the narcosis.

It has been found, that prompt narcosis is obtained by giving at first air saturated with bromide of ethyl (a mixture too weak would give only incomplete anaesthesia); its use becomes dangerous if the inhalations are continued, whatever the degree of the mixture.

Many animals experimented upon died either under the bromide, or from 36 to 48 hours after the anaesthesia. The death has always been due to asphyxia; cardiac syncope has never been observed, and the arrest of the heart has always been preceded by arrest of the respiration.

Again, from our experiments made upon dogs, anaesthetized by a simple compress or covered by an impermeable cloth, it results that the latter is dangerous and may lead to asphyxiation.

To avoid these accidents, one should not try to obtain true anaesthesia as generally understood, but a transitory condition which precedes it.

This method, that MM. Lermoyez and Helme have used for a year, consists in only introducing into the system a dose sufficient to paralyze the cerebral hemispheres alone, without reaching the medulla.

We know, by the works of Prof. Dastre, that the nervous centres are successively impressed by the anaesthetic agent, first the brain, then the medulla. But while the chloroform there exists only a relatively short space between the paralysis of the brain and that of the medulla, with the bromide there is a long interval between. It is this period that we look for to

operate. It is a matter then, in this method, of the abolition of the cerebral faculties and of the consciousness alone without the medulla being affected; it results therefore that if the sensibility to pain is not abolished, the conscious perception of that pain is momentarily suppressed; the patient, therefore, does not suffer and does not struggle.

In this method, the same general precautions are observed with regard to the patient as in anaesthesia.

Patient should be placed directly in position for operation. The following is the best: "The little patient is seated upon the knees of an assistant, who holds his knees between his own, while with the right hand the assistant holds the patient's head, in the left he takes the hands which for greater precaution are imprisoned in a sheet placed around the body." (Helme.)

The permeable flannel mask is the best to use. Upon the flannel mask are poured at once, for a child of 3-8 years, 5 grammes of freshly prepared bromide of ethyl; for a child of 8-15 years, 5 to 10 grammes. This should not be exceeded in any case. The mask should be softly (gently) applied over the nose and mouth, leaving the eyes, which indicate the moment to operate, uncovered. The duration of the inhalations is very short; the mask is only left from 15 to 35 seconds.

The first effect upon the patient is characterized by a movement of the head to disembarass itself of the mask, generally with a period of about 10 seconds of apnoea then, to this arrest of respiration succeeds deep, broad inspirations during about 15 seconds. The eyes, oftenest widely opened, present an injection of the vessels of the conjunctiva at the same time a slight dilatation of the pupils. At this moment the mask is removed and the operation begins.

The period of inhalation is therefore very short; the mask is only left for 15-35 seconds, and in no case longer than 40 seconds. If one counts that the period of apnoea lasts about 10 seconds, the patient then has only inhaled the bromide of ethyl from 7-25 seconds.

This sleep is characterized by the persistence of the muscular tone, by the conservation of the pharyngeal and laryngeal reflexes and the absence of trismus. Indeed, during the operation, mobility of the head is not observed, neither the dropping of objects held in the hand; the assistant perceives perfectly the tonicity of the muscles of the neck. Trismus is rarely seen with this method; if it sometimes exists, it is so little pronounced that a slight pressure with a tongue-depressor is sufficient.

In conclusion: "The patient does not truly sleep, and as he is not under chloroform anaesthesia, he seems to be in a waking condition, but he does not feel, which is the main thing for him, and he does not resist, which is essential for the surgeon. Even if perhaps he cries during the operation, he never remembers it afterward. To seize the moment when the brain is become paralyzed, the inhalations must be stopped from the moment the pupil begins to dilate and the conjunctiva begins to be slightly injected. (Lermoyez.)"

ACUTE OTITIS WITH MASTOID COMPLICATIONS,
CURED WITHOUT SURGICAL INTERVENTION.

DR. M. MANDLESTAMM.

ANNALES DES MAL. DE L'OREILLE, ETC.

Abstracted by H. A. Alderton, M. D., Brooklyn.

This case seems interesting from several points of view.

Should paracentesis be practiced at the beginning of an acute otitis media? Some say yes, others no. These are evidently the extremes on one side and the other. If, on the one side, paracentesis is in many cases salutary and inoffensive, on the other side it is evident that it must not be practiced without distinction in all cases of acute inflammation of the tympanum. It is indicated always when rupture of the tympanum is imminent, or where the otitis is accompanied by alarming inflammatory phenomena or acute pain. The incision of the M. t. is oftenest indicated in infants, in whom the petro-squamous suture is not completely ossified, and who, consequently, more than adults, are menaced by a propagation of the inflammation to the meninges. In such a case, the necessity of paracentesis cannot be too greatly insisted upon, and one may say with Haug: "It is better to incise both membranes than to wait too long." But the same author in affirming that paracentesis can never be wrong (harmful) evidently falls into exaggeration. Without speaking of nervous or apprehensive subjects with whom paracentesis might present great inconveniences, we must consider the complications which might follow a useless or inopportune operation. Thus, Politzer advising against paracentesis in the light forms of acute otitis, says he has observed several times, cases of acute bilateral otitis in which paracentesis, practiced upon one side, was followed by a prolonged suppuration of the corresponding ear, while the cure of the side not incised was quickly effected with complete re-establishment of hearing, by insufflations of air. Our case goes to

confirm Politzer's opinion. It is needless to say that we do not remain partisan in the matter, that we consider it a salutary operation always where there is indication for it. What we wish only, is that in the beginning of an acute otitis media, the possibility of cure without operation should be considered before all.

NECROSIS OF THE LABYRINTH.

RUEDA.

ABSTRACTED FROM ANNALES DES MAL. DE L'OREILLE, ETC.

By H. A. Alderton, M. D., Brooklyn.

Case of otorrhoea following measles, with facial paresis cured after extraction of several small sequestra representing the greater part of the labyrinth.

This observation is interesting by its rarity (68 observations); the conservation of a certain amount of hearing, perception of the voice at 4 metres, finally, disturbances of equilibrium (in walking, tendency to fall to the side affected) independent of all meningo-encephalic lesion, as the absence of all other cerebral symptoms shows, and the almost immediate disappearance of the phenomena after ablation of the sequestra.

ABSTRACTS FROM CURRENT GERMAN LARYNGO- OTOLOGICAL LITERATURE.

BY GEORGE MORGENTHAU, M. D.,

OF CHICAGO.

A woman came under the treatment of Szenes, of Budapesth, (Allg. Wien. Med. Zeit., 9 Juni, 1896) for severe pains in one ear, due, apparently, to a well-marked diffuse external otitis. After 23 days of treatment, great improvement set in, with desquamation of the auditory canal; leaving a little crust on the lower wall near the external opening. Ten days later, a small scar was seen on this spot, resembling those left after vaccination of the arm. It appears that the woman infected her ear from the pustules on the arm of the infant she was nursing. A typical pustule on the woman's cheek left no doubt as to the correctness of the diagnosis.

In the Hamburg Medical Society, Cohen-Kypser (Wien. Med. Blaetter, 16 Juli 1896) relates unique attempts, extending over three years, to destroy, by the injection of solutions of ferments, the strands of new-formed connective tissue which cause deafness by fixation of the ossicula. He throws solutions of papayotin into the drum-cavity; later, of pepsin. The latter are more efficacious than the gastric juice of carnivorous (dog), preferable to that of herbivorous (cow) or omnivorous (hog) animals. Digestion was best at the concentration of 1:10000. The quantity injected was 3-4 decigrams; larger doses are too irritating. The best result is obtained after half an hour to an hour. The method was tried in 130 cases (49 bilateral affections).

In about 2-3 of the cases, the author thinks the hearing was doubled or trebled. Although the prognosis must be made with some reserve, and this method be considered only a therapeutic attempt, the author believes in the decided improvement of the subjective and objective symptoms of his patients as well as in the permanence of the results obtained.

ETIOLOGY OF PERITONSILLITIS.

Logucki, assistant at the Holy Ghost Hospital at Warsaw, makes a contribution to the etiology of peritonsillar abscesses (*Arch. Lar. & Rhin.* IV, II, 244), based on bacteriological and clinical examinations. The disease appears in two forms. Firstly, cases in which, the abscesses being located between anterior pillar and tonsil, there is much bulging of the soft palate and the anterior pillar, and marked edema of the uvula; and secondly, abscesses between tonsil and posterior pillar, with less decided symptoms but of longer duration and greater severity. Specimens of pus were obtained by puncturing the anterior pillar with a sterilized hypodermic syringe. On the basis of eleven cases examined bacteriologically and of numerous clinical observations, he sums up as follows:

1. Peritonsillar abscess is usually secondary; it is found in individuals subject to frequent attacks of common tonsillitis; occasionally it occurs in diphtheria. Adhesions between the surfaces of tonsil and pillars, often the result of tonsillitis, close the crypts during later attacks, prevent the pus from escaping, and thus irritate the peronsillar tissue and produce inflammation. Clarence Rice, in confirmation of this theory, adduces the fact that such abscesses do not occur in young children.

2. The presence of pyogenic bacteria (staphylococci and streptococci) is easily accounted for, since it has been established that in the tonsillar crypts, even in healthy people, numerous pathogenic germs are to be found, of which staphylococci and streptococci play an important part in tonsillar affections.

3. On opening the abscesses, streptococci were found predominating in the pus of the first days; somewhat later, staphylococci and streptococci; in tedious cases, generally staphylococci. Possibly the fact, well known in bacteriology, that streptococci are overwhelmed in their growth by staphylococci, may explain how a process which, in the beginning, seems of a most serious character, generally runs its course without causing great mischief (abscesses in neighboring organs, general infection) when the abscess is opened artificially or spontaneously.

RHEUMATISM OF THE CRICO-ARYTENOID JOINTS.

Sendziak, of Warsaw, (*Arch. Lar. u. Rhin.* iv. 2, S. 264) describes a case of rheumatic inflammation of the crico-arytenoid joint—of which there are remarkably few on record—which offered some difficulty of diagnosis. A woman, hitherto in good

health but with hereditary taint (father had had laryngeal tuberculosis), toward the end of pregnancy suddenly fell sick under conditions which pointed to infection of influenza (the acquaintances with whom the patient was stopping at the time were suffering from influenza). A rather severe inflammatory process—beginning, apparently, in the larynx (crico-arytenoid joint), spreading to other joints, mainly the left elbow—set in with distressing symptoms, especially pain and difficulty in swallowing, aphonia, high fever and great weakness. The question arose if the disease of the crico-arytenoid joint had any connection with the general condition, parturition and disturbances in the joints of both extremities. The tubercular predisposition and the laryngeal changes (aphonia, dysphagia, redness and swelling of posterior wall, suspicious mucus on posterior wall) pointed, at first, to tuberculosis. But the lack of all symptoms (of cough and expectoration as well as of physical signs) spoke against this supposition. An interdependence between the affections of the different joints seemed probable. Pyemia had to be excluded because there were no local changes in the genital organs. For the same reason, gonorrheal infection was improbable; moreover, examination of the vaginal secretion for gonococci was negative. As to influenza as the not at all impossible cause of joint troubles, the author contents himself by saying that such complications have not been reported in influenza. He therefore concludes that his was a case of primary rheumatism of the crico-arytenoid joint, later on affecting other joints during and after parturition (polyarthritidis rheumatica).

The treatment consisted of large doses of salicylate of soda, until the ear symptoms compelled a change to ichthyol (0.25 t. i. d., in capsules), nitrate of silver ointment (12%), and vapor baths. Frequent insufflations of cocaine powder (10%) improved the local symptoms greatly until they subsided after two weeks.

ETIOLOGY OF LARYNGISMUS STRIDULUS IN THE LIGHT OF THERAPEUTIC RESULT.

H. Rehn, Frankfurt-on-the-Main (Berl. Klin. Woch. No. 33, 17 Aug. 1896). Spasm of the glottis, in its clinically important form found in the first and second years of childhood, affects *only faultily fed* infants, who have been brought up artificially either from birth or after weaning, or to supplement insufficient mother's milk. *Never is it observed in infants fed at the breast only.* And since faultily nourished children are rachitic nearly without exception, this factor has, of late, been considered the most important one. Laryngis-

mus stridulus, furthermore, is rarely an isolated spasm of the adductor muscles; almost always the rest of the respiratory muscular apparatus is also affected (expiratory apnea, etc.) Moreover, in many cases, glottic spasm is combined or alternate with tonic spasms of the muscles of the extremities, especially of the hands and feet (carpopedal spasm, tetany), or general clonic spasms (eclampsia). There are even cases of eclamptic convulsions of a puzzling nature, persisting for some time, until a spasm of the glottis sets in and solves the problem. In contrast to this rather uniform and typical group of symptoms is the variety of supposed causes. Among them are tuberculosis of the bronchial glands, cerebral diseases (cerebral hypertrophy, chronic hydrocephalus), and lately again, enlargement of the thymus. In all these cases, especially in the first two, we, according to the author's experience, are dealing with complications, not causes of the disease. Putting aside the theories about the influence of the elongated uvula, subluxation of the odontoid process, and difficult dentition, there remain but two theories worthy of discussion. One, ascribing the cause to faulty nutrition, to burdening the gastro-intestinal canal with faulty or too much food, considers the symptoms a reflex spasm called forth by the sensitive nerve-endings of the pneumogastric. The other, seeking the cause in rickets, with which most faultily fed children are known to become affected, interprets the spasms as arising from direct irritation of the cerebral centers.

Most modern writers lay the greatest stress on rickets, either referring to the altered composition of the blood or to certain changes (pressure on the softened occiput, irritation of the centripetal pneumogastric fibres in the jugular foramen). Kassowitz, however, ingeniously explains the occurrence of glottic spasm and expiratory apnea by irritation of certain centers of the hemisphere, produced by inflammatory hyperemia of the cranial bones, or, rather, by the congestion in them and the meninges (especially in the softened occiput and in the vicinity of the abnormally open fontanel). Experiments made later on animals bore out his assumption most fully. Semon, Horsley, and Krause, on irritating a circumscribed spot in the frontal brain of the ape and other animals, invariably brought about complete bilateral adduction of the vocal bands, i. e., closure of the glottis; while Unverricht and Preobaschensky, by irritating another spot in the frontal brain—which is to say, by irritating parts of the cerebrum within the scope

of influence of the rachitic hyperemia of the cranial bones, near the great fontanel—produced expiratory apnea. Thus the etiology of some important forms of this group of spastic symptoms seemed certain to the author until a number of observations made within the last two years opened a new view. Five infants less than one year old, artificially fed (all with cranial rickets, some markedly so), suffered for some time with expiratory or eclamptic spasm or with both forms. Every one of the symptoms ceased entirely, either immediately or within two to three days, when the children were put to the breast by good wet-nurses. There is no possibility of doubt that the disease was caused and kept up by incorrect food, and not by rickets. For the convulsive attacks remained away forever, although the children showed the stigmata of cranial rickets and retained them for weeks, even months, afterward.

Rickets should, therefore, in the author's opinion, not be considered an etiological factor in these spasms. We should have come to this conclusion on observing spasm of the glottis, etc. occur in non-rachitic nurslings immediately after weaning. We are, in fact, dealing with a reflex spasm produced by the sensitive pneumogastric endings in the stomach, superinduced by faulty nutrition, subject to certain as yet unknown, conditions—for only a certain percentage of artificially fed children are afflicted with this disease. As cause, we must probably assume (as has been done in tetany) that toxins are formed in the stomach, of fugitive nature since convulsions ceased upon the *first* ingestion of human milk.

DEATH WITH THE SYMPTOMS OF CROUP.

Dr. Biedert, of Hagenau (Berl. Klin. Woch. No. 26, 29 Juni, 1896), contributes an interesting case to the study of enlargement of the thymus and bronchial glands. A boy of ten months was brought to the hospital, at noon, with the diagnosis of croup, and with the statement that the disease had grown worse since its inception, the day before, so that an operation might become necessary at any moment. Respiration was very stenotic, with a clear voice; the pharynx free from much inflammation and any deposit; temperature, 38.4 in the rectum. Although no diphtheria bacilli had been found as yet, the usual treatment was begun, as diphtheria was then prevalent. A prominence in the upper part of the sternum was noticed in passing. When the author was called, between four and five, on account of the increased dyspnea, he examined the prominence and found it corresponding to a marked dulness, which

he ascribed to thymic enlargement. But as he knew of cases in which it occurred with croup, he did not change his diagnosis. Intubation brought no relief. After an hour, tracheotomy was performed because of the possibility of ascending croup. But neither was the breathing improved nor were membranes ejected. In the effort to clear away the tracheal obstructions with a soft catheter, insuperable resistance was met a little farther down. The child died. A postmortem examination was made the same day. The greatly swollen thymus reached to the thyroid gland above; showed, in the region of the supra-sternal notch, a deep impression made by the upper edge of the sternum; was 7.5 cm. long and 7 cm. wide, and weighed 21.6 grams after the removal of all cutaneous adnexa. It measured 1.5 at its greatest thickness in the right lobe, and 1 cm. in the left, and extended somewhat around the trachea. After removing all soft parts and putting the sternum in place again, the distance between the latter and the vertebral column was 1.5-2 cm. About both bronchi, contiguous to the thymus, were two packets of swollen bronchial glands, the left the size of a walnut, the right of an almond. The upper part of the lungs was inflated; the lower, atelectatic; the heart, very large; the left ventricle, filled. No other cause of death could be found than the pressure exerted upon thymus and bronchial glands, with trachea and vessels, by sternum and vertebral column. The special feature of this case lies in the *addition of enlarged bronchial glands*, which probably brought about death, as the still greater thymus alone did in other cases. Bacteriological examination made after operation and autopsy showed the absence of diphtheria bacilli. The bronchial and thymus glands had neither microscopic nor macroscopic signs of tuberculosis. In several similar cases reported, death occurred during an attack of laryngospasm. A regular casual relation between thymic enlargement and spasm of the glottis has been shown by Friedleben to be improbable, as he found that, of 75 children with laryngospasm, in but 7 the thymus was above the average; and again, that with very large glands there was no laryngospasm. However, his own figures (60 children with small thymus, of whom only 5 were affected with laryngospasm; and only 20 with larger thymus, of whom 8 were subject to laryngismus) prove that large thymus glands are more frequent in laryngismus than small ones; that there is, perhaps, some kind of a relation between them. It might be—in contradiction of former theories—that spasms of the glottis maintain or promote swelling of the thymus. The fre-

quently recurring suffocative hyperemia of the organs below the glottis and in the chest would, thus, maintain the size of the thymus glands, and even increase it, especially in somewhat larger glands. Pott tells how the head is regularly thrown back in asphyxia. Thus the fatal triad is, originally large gland, acute hyperemia, and smart narrowing of the sterno-vertebral space by a sudden lordosis of the cervical vertebrae.

This explanation does not agree with the theory sometimes advanced that the swelling produces an irritation which leads to spasmodic closure of the glottis and asphyxia, as the spasm sets in first. And Pott has shown that this spasm does not cause death, by performing instantaneous tracheotomy with one incision, and yet not averting death. The cause of death must, therefore, be lower down, either the circulatory obstruction from pressure on the veins and right heart, or the respiratory embarrassment from pressure on the trachea and bronchi. The author concludes, from his own and other cases, that both are effective factors

(We refer to a case which is reported quite briefly in the August number of the *Monatsschr. f. Ohrenheilk.*

In the meeting of the Medical Society of Nancy, held May 29, 1895, Dr. Haushalter spoke of a child of nine months who died suddenly, within a few minutes, from asphyxia. Post-mortem, only hypertrophy of the thymus was found. It was 10 cm. long, 5 cm. wide, and weighed 50 grams. It did not compress the trachea completely, or there would have been prodromal symptoms. The author thinks a sudden congestion of an already hypertrophied thymus produced a fatal reflex spasm of the glottis.)

PHARYNGEAL AND FAUCIAL TONSILS AS DOORS OF ENTRY FOR TUBERCULOSIS.

By Georg Gottstein, of Breslau. (*Berl. Klin. Woch. No. 31 and 32. Aug., 1896.*)

Postmortem examinations have shown tuberculous disease of the faucial tonsil to be the cause of swellings of the cervical lymph glands. But the tonsillar disease should not be called primary, as there were extensive tuberculous processes in the lungs and other organs in all cases, and the tonsillar disease was most probably secondary—autoinfection—the result of contact of the tonsils with the bacilli-charged expectoration. True primary tuberculosis of the nasopharynx and oral cavity—aside from accidents with unclean instruments—is produced only either by the inspiration of infected dust particles (Koch) or the ingestion of food (Baumgarten). There are but few con-

vincing reports of tuberculosis of the pharyngeal and faucial tonsils only, without other changes in the body. Gottstein observed six patients in whom, without the least sign of tuberculosis aside from very small cervical and submaxillary glands, upon systematic examination, tuberculosis of the excised hyperplastic pharyngeal and faucial tonsils was found. He examined (in Professor Stoerk's Dispensary at Vienna) 33 pharyngeal tonsils, of which 4 proved tuberculosis, about 12%; and 20 faucial tonsils, among which there were 2 cases of tuberculosis, 10%. If the patients had shown other tuberculous changes, infection by the blood or lymph channels would have to be taken into consideration. And there were no signs of retrograde infection by the lymph ascending from the cervical glands. And such a mode of infection is very improbable. Another way of infection is from the free surface. The pharyngeal tonsil seems particularly liable to infection by the inspired air because of its exposure to the current and of its structure.

The same conditions held good in regard to the faucial tonsils in two children who were forced, by postnasal growths, to breathe through the mouth. Infection by food is quite possible, all the more so if the tonsils are hyperplastic. Microscopically, not only giant cells were seen in all cases but also distinct tubercles. It is worthy of note that neither caseation nor tubercle bacilli could be found. Strassmann, long ago, showed that isolated tonsillar tuberculosis (without involvement of pharynx and palate) differs essentially from the tonsil in pharyngeal tuberculosis. In contrast to the extensive caseation and ulceration in the latter, we find, in the first, nearly exclusively, minute, miliary tubercles in varying quantity, sometimes but a few in several sections. These tubercles contain many giant cells and resemble most those of lymph glands; but rarely is there somewhat more caseation; bacilli are sporadic. According to the reports on nasal tuberculosis, bacilli were found easily only in those cases in which the process in the nose was but a part of the far advanced pulmonary tuberculosis. When the disease was limited to a local focus, bacilli were discovered but rarely. It must be a peculiarity of certain tuberculous diseases of lymphoid tissues that examinations for bacilli are so often without result. The tubercles can be easily and distinctly recognized in stained specimens of lymphoid tissue; the lymphoid cells being colored a deep blue by the hemotoxylin, while the epitheloid cells of the tubercles imbibe the eosin. The tubercle is stained much less than the surrounding lymphoid tissue. It is difficult to dis-

tinguish it from lupus. Michelson asserts that, microscopically, the differential diagnosis between lupus and tuberculosis of the nasal mucous membrane is hardly possible. Bresgen even denies the existence of nasal tuberculosis, calling all the cases lupus. Some pathologists state that vessels are found in the tubercles in lupus, and not in tuberculosis. There were no vessels in the author's cases. The changes could not have been gummatous, because caseation is essential, and giant cells are not formed except when there is mixed infection of syphilis and tuberculosis. Around foreign bodies, giant cells and tubercles may form. In practically all the cases, the influence of foreign bodies could be excluded. It is presumed, in all of these cases, that the tonsils had been hyperplastic before the entrance of the tubercle bacilli. The tuberculous process was always limited to a very small portion. It is not probable that such small foci could cause hyperplasia of the whole tonsil. It also seems more plausible that bacilli attack diseased tissue. Trautmann's opinion that simple hyperplasia of the pharyngeal tonsil is caused by tuberculosis (Schwartz's Handb. d. Ohrenheilk. Bd. 2 S. 152) will hardly be shared by many, although he supports it by Koch's statement that, after tuberculin injections, he saw a reaction take place in hyperplasia of the pharyngeal tonsil, fever with subsequent swelling.

The prognosis seems extraordinarily favorable. The tuberculosis is local, with not the least tendency to rapid growth, and probably only dangerous to an organism weakened by other diseases. Only for the ear are the conditions unfavorable in tuberculosis of the pharyngeal tonsil. The muco-membranous lining of the tonsil is in such intimate contact with that of the tubal openings that infection of the middle ear is very easy. Schuetz (Virchow's Arch. Bd. 69 S. 93) has proven this mode of infection in the pig. For this reason alone, operative interference is necessary in all cases of hyperplastic pharyngeal tonsil. Unfortunately, we have not as yet the least clinical sign of tuberculosis of the pharyngeal tonsil. In nearly all such cases, the cervical lymph glands are swollen, but the author made microscopical examinations of hyperplastic pharyngeal tonsils when the glands were greatly enlarged, without finding tuberculosis. And again, he did not even find hyperplasia of any of the tonsils. It, therefore, appears necessary to him to operate in all cases of hyperplastic tonsils even if there is no obstruction to breathing, in order to avoid the possibility of infection.

ELECTROLYSIS IN CONNECTIVE TISSUE STRICTURES OF THE EXTERNAL AUDITORY CANAL.

By Professor Ostmann, of Marburg. (Berl. Klin. Woch. No. 34, 24 Aug., 1896).

Acquired connective tissue strictures of the external auditory canal usually may be ascribed to ulcerations in the course of chronic middle ear inflammations. The granulations spring up, meet, coalesce; thus leading either to complete connective tissue atresia, or greater or less stenosis. If the middle ear continues to suppurate after the formation of the stricture, great danger arises from retention of pus, and invasion of neighboring organs (mastoid process, labyrinth, cranial cavity). Hitherto, operative attempts to remove the strictures have been quite unsuccessful. Even after splitting the stricture by crucial incisions and removing the flaps, stenosis of the canal results finally. Similar has been the experience with dilatation by means of laminaria and compressed sponge tents; galvanocaustic destruction is, also, generally not crowned by permanent results. Excision of a ring-shaped piece, followed by the introduction of laminaria tents until the wound was covered with skin, proved successful in Schwartz's hands. The after-treatment, however, is exceedingly painful, and nearly intolerable to some patients. In addition, there is the danger of infection of the wound by the fetid aural secretion, and of secondary inflammation of the canal. The author, therefore, tried a method free from these disadvantages, yet effectual. The right canal was narrowed, $\frac{3}{4}$ cm. within the external opening, by a connective tissue stricture, to such a degree that an antral canula only could be forced through the slit remaining below and behind. The internal portion of the canal could not be freed from the very fetid pus, because there was not room for the return flow of the irrigating fluid. The patient complained of occasional headache on the right side. The stricture, measured at its base with the bent probe, was about three or four mm. It was removed, permanently, in four sittings, by electrolysis, in intervals of eight to ten days. After thorough disinfection, a double needle was thrust, at the upper wall, through the base of the stricture, and a weak current of four or five M. A. passed through it for five minutes. In the next two sittings, the connective tissue arising from the anterior wall was destroyed, and lastly the posterior portion of the newly-formed tissue. Each time a little iodoform powder and gauze were introduced. Even with weak currents, the pain is quite severe, although it was not necessary to inject cocain, which is to be

recommended with more sensitive patients. The reaction was exceedingly slight. Upon this fact the permanent success following this treatment seems to rest; for the greater the inflammation of reaction the greater the tendency to the formation of new tissue and, thus, to re-formation of the stricture. The necrosed tissue sloughs off with hardly any reaction when weak currents are used. The time elapsed since the removal of the stricture (over one year) seems sufficient to preclude a narrowing of the lumen, which persists 7 mm. in height and 6 mm. in breadth, up to now. The middle ear trouble was quickly cured on removal of the obstruction.

THE DIPHTHERIA QUESTION.

Professor Carl Fraenkel, the eminent bacteriologist (Berl. Klin. Woch. No. 36, 7 Sept. 1896), in his theses for the diphtheria discussion, at the next meeting of the German Public Health Association, gives a brief but comprehensive resume of the present status of the question.

1. The cause of diphtheria in its true sense is the bacillus discovered by Loeffler. The germ is to be found (a) regularly in the diseased portions (skin and mucous membranes), (b) often in the patient's vicinity, (3) rarely on the mucous membranes of healthy individuals.

2. Infection is carried (a) immediately, to the healthy by the sick (coughing on a second person, kissing, etc.); (b) mediately, by objects to which the specific germs adhere (beds, linen and clothes, toys, dishes, food, etc).

3. The development of the infection depends altogether on a special disposition, as is proven by the presence of diphtheria bacilli in healthy organisms.

The struggle against diphtheria must, therefore, be directed to

1. Destroying the bacilli: (A) in the sick by (a) quickly curing, and shortening the course of the disease with the aid of the specific therapy with Behring's serum; (b) local treatment of the affected parts with disinfectants (Loeffler's mixture); (B) in the patient's house, by disinfection of the diseased products (sputum, membranes) as well as of the sick room, linen, clothes, etc.

2. Infection is carried (a) immediately, to the healthy by the sick (coughing on a second person, kissing, etc.); (b) mediately, prohibiting the patients and relatives from attending school;

forbidding people, especially children, to congregate in the houses of the sick or dead; supervising the traffic with victuals.

For 1 and 2 are of the utmost importance.

(a) The earliest possible recognition of genuine diphtheria by means of bacteriological examination of all suspicious cases, preferably at special central laboratories; and (b) compulsory notification based on the results of these examinations.

3. Removing the disposition by (a) care of the mucous membrane of mouth and throat; prophylactic gargling with disinfectants; (b) immunization with Behring's serum.

ON CEREBRAL DISEASES AFTER OTITIS MEDIA.

By PULSON (Archiv. f. Klin. Chirurgie, vol. 52, II).

Abstracted by J. HOLINGER, M. D., of Chicago.

These diseases are the cause of death in 0.3%, that is, 3 to 1000 (14580 post-mortems). There are the four well-known affections; cerebral abscess, meningitis, sinus thrombosis and epidural abscess. The diagnosis of brain disease in otitis, as well as the differential diagnosis of these groups, offers considerable difficulties, because the symptoms are only exceptionally characteristic, and combinations are frequent.

P. reports 53 cases. In 52.8% the disease originated from the right; in 45.3% from the left, and in 1.9% from both cases. His figures are interesting, although they are not new. He found:

Abscess of the temporal lobe, 12; on the right side, 8, on the left, 4
 Abscess of the cerebellum, 5; on the right side, 3, on the left, 2
 Sinus thrombosis 17; on the right side, 8, on the left, 9
 Meningitis 18; on the right side, 9, on the left, 9

Meningitis started from both ears at the same time in one case.

I. Of the patients with abscess of the right temporal lobe, two recovered, six died, while of those in whom the abscess was on the left side, one recovered and three died. None of the patients suffering from abscess of the cerebellum recovered. Four of the five were females. In a large proportion of the cases the abscess of the brain is located in the temporal lobe, and infection takes place either through the tegmen tympani or along the vessels. The dura is not always adherent to the skull. The route of infection in abscess of the cerebellum is either along the aquaeductus cochleae or along the acoustic nerve, or through the inner table of the mastoid cells, after destroying it. The diagnosis is based on three groups of symptoms. The first includes those that are caused by supuration, and are not pathognomonic in these diseases. The second group is formed by the symptoms of brain pressure, as

drowsiness, paresis, headache, vomiting and slow pulse. The third group contains the focal symptoms, which are indistinct except in abscess of the right temporal lobe. Here we may be aware of aphasia, which is often not alone due to pressure, because it lasts sometimes for months after pressure is removed. The development of the symptoms is gradual, intermittent attacks of grave sickness alternating with periods of apparent health. The abscess generally has no membrane and contains badly smelling pus with sloughing brain tissue. Perforation into the ventricles may cause sudden death, simulating apoplexy. The prognosis without an operation is bad. The trephining is done in various situations; as a rule, behind and above the meatus. Often in abscess of the cerebellum, the sinus is in the way. The dura is sometimes so tense that pulsation can not be seen, and only exceptionally is there found a discolored spot as a sign of the abscess. It is preferable to incise the dura with a knife instead of using a trocar. A prolapsus of the brain cannot be avoided; this, however, will shrink as soon as the abscess is emptied.

II. Sinus thrombosis is reported seventeen times; only two of the cases recovered. As to sex and as to side of occurrence, the death rate is almost even. The blood is often stemmed in the veins of the face and the fundus of the eye. In operating, the main question is whether or not to ligate the jugular vein. The author is not in favor of it, because one does not always know how far the thrombus extends; particles might be loosened by handling the vein, and further it does not offer complete safety. The main indication is to evacuate the pus and let the rest alone. Metastatic abscesses are frequent.

III. Meningitis. There is no recovery reported out of eighteen cases. It originates just as frequently from affections of the right as of the left ear, but men seem to be slightly predisposed. Its onset is often without any warning, so that people who go to bed in apparent health, perhaps only with some headache, may be found in the morning comatose, suffering from acute meningitis.

Since all these affections occur, for the most part, in chronic suppurations of the middle ear and especially of the attic, it follows that we should never be indifferent to long-standing suppurations of these parts, especially when attended by occasional headache, fever and anaemia.

ABSTRACTS FROM AMERICAN AND ENGLISH
RHINOLOGIC AND LARYNGOLOGIC
LITERATURE.*

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**SOME REMARKS UPON EPITHELIOMA OF THE TONGUE, MORE ES-
PECIALLY WITH REFERENCE TO THE NECESSITY FOR EARLY
AND RADICAL OPERATIVE INTERFERENCE.**

Dr. E. B. Haworth states that there is not so great a tendency to recurrence of the primary disease in cancer of the tongue, as is usually manifested in mammary disease. (Med. Review, Aug., 1896.)

The experience of most surgeons enables them to testify that, after operations for excision of the tongue for cancer, recurrence is almost always in the glands, and rarely in the stump, and that partial amputation of the tongue, where the disease is limited, seems to have been as successful as total removal.

There is no doubt that the search for and removal of the diseased lymphatics must add considerably to the danger of the operation. Shock from operations on the tongue is not necessarily great, but if the neck is invaded, and extensive dissections are made to remove the glands, the shock is considerably increased. Early operations, before extensive infections of these glands occur, will, in some measure, obviate this danger and others incident to extensive dissection of the neck.

*The object of this department is to give a synopsis of all important rhinologic and laryngologic literature published in the English language. Where an abstract of such an article is not given, the editor of the department will appreciate the calling of his attention to such omissions. Reprints should be sent where practicable.

A CASE OF GLOSSITIS.

Dr. W. Washburn reports a case of glossitis in which the symptoms were so violent that the patient appeared to be choking to death. (Medical Record, Aug., 1896). Inflammation first commenced on the left side of the tongue and afterwards developed on the right side. The symptoms were relieved by making free incisions on both sides applying leeches and the application of cracked ice.

The case presents the following peculiar features:

No cause could be found for the glossitis. There were no sharp edges on any of the teeth; the patient had never had syphilis, and no other known poison had been observed or injected; recovery took place without the formation of pus.

NASAL CAVITIES.

SURGERY OF THE NASAL VESTIBULE WITH REFERENCE TO CERTAIN FORMS OF STENOSIS AND FACIAL DISFIGUREMENT.

Dr. Robert C. Myles states that the surgery of the nasal vestibule has not received the serious and careful attention which its importance demands. (Journal of American Med. Assn., Sept., 1896.) Abnormalities in this region not only obstruct the gateway to physiological respiration, but also disagreeably alter an otherwise pleasant facial expression. He cautions against attempts to enlarge the lumen of the individual by excision of the surface tissue, as the contraction of the fibrous tissue in the membranes beneath the pavement epithelium, which is found in this region, almost invariably produces the opposite result, by narrowing it.

He describes a case of an eighteen-year-old girl, in which a membranous occlusion, about one-third of an inch within the nostril, extended from the superior part of the vestibule, near the lateral cartilage down to the floor. After cutting through and removing the membrane, which was one-fourth of an inch in thickness, he placed three rubber tubes together, side by side, into the fossa; they were worn for a few months with most excellent results.

In referring to stenosis, due to deflections of the anterior part of the triangular cartilage within the vestibule, he has had but little success in attempting to replace this tip, by fracturing the convex cartilage into the opposite nostril, and maintaining the segments in position with mechanical appliances. He prefers the operation in which the perichondrium and the mucous membrane are dissected from both sides of the carti-

lage, and, after removing the obstructing portion of the cartilage, the parts are brought together with fine silk sutures. He does not remove the anterior part of the cartilage, which is left for the purpose of sustaining the tip of the nose in its proper position.

In the discussion, Dr. Max Thorner reported the case of a young man, who had been kicked on his nose by a mule, resulting in entire occlusion of the right nostril. It was corrected by taking a flap from the upper lip, turning it upward to the nose and sewing it to the inner surface of the ala nasi, after having loosened it from its adhesions. The operation was followed by permanent improvement.

Dr. Hanau W. Loeb also reports a case of complete stenosis, as a result of small-pox, there being complete adhesion to both edges of the nostrils to the septum. To maintain the opening, two rubber tubes, made after the fashion of Simrock's speculum, were inserted and were worn without discomfort for six months. They were worn afterwards only at night, and at present there is a complete opening.

INTRA-NASAL SURGERY--WHEN NOT.

Dr. E. R. Lewis shows the necessity for greater conservatism in intra-nasal surgery. (Ind. Med. Journal, Aug., 1896.) He deprecates, however, any general condemnation of such work. There is too much benefit given in many ways, by relief of nasal irritation or removal of nasal obstructions, to justify any candid physician in withholding his approval of intra-nasal work, which, when properly done, frequently gives the most satisfactory result. Such prejudices may place a physician in an embarrassing position, as in the case of a patient who had been treated for nearly four years, by three physicians for an obstinate cough. She finally went to Dr. Bell, who, on examination, found a post-nasal polypus, the removal of which gave immediate and complete relief.

On the other hand, intra-nasal surgery is not called for in one-tenth of the cases which come for treatment, and even in some of these cases, there may be a better method of treatment. When a hypertrophied turbinated body is reduced by a snare, it may seriously interfere with its functions as a barrier against the entrance of cold air, by preventing it from swelling physiologically, by reason of such irritation, with warm blood, so as to delay the inspired air in transit, and warm and moisten it before its entrance into the lungs. When, however, the posterior extremity of the turbinal is hypertrophied into a large round

mass with a cauliflower-like surface, its surgical removal is indicated.

Hypertrophy of the pharyngeal tonsils would seem to demand surgical treatment more certainly than the hypertrophy of turbinated bodies, but even a comparatively large percentage of such cases may be treated without surgical interference, with good results.

"Intra-Nasal Surgery—When Not," is a question which may be answered thus: In cases of nasal catarrh, so called hay fever, asthma and a long list of disorders frequently referred to as of nasal origin, never as a "cure" for the disease but only for the removal of a complication. Never, unless a careful examination has been made and a history of the case taken, and then only when intelligently and distinctly called for; never in cases not distinctly surgical, until other, and, perhaps, better methods have been tried; never when the patient has not been advised and a consultation with the family physician suggested.

(The conservatism indicated in this article is the return swing of the pendulum of excessive nasal surgery, but the pendulum always swings beyond the median line. Since the first published reports of Voltolini, of the cure of asthma by the removal of nasal polypi, the literature of the subject shows too many well authenticated cases of cure of asthma and other reflex nervous disturbances, by the removal of a center of disturbance in the nose, to warrant the conclusion of "never—in asthma, and a long list of disorders frequently referred to as of nervous origin, never as a 'cure' for the disease, but only for the removal of a complication." Scheppegrell.)

REMOVAL OF FOREIGN BODIES FROM THE NOSE.

Dr. J. F. Rickenbach reports the case of a patient suffering from nasal catarrh, complicated with profuse discharge and occasional scanty hemorrhage. (Medical Review, Aug., 1896.) She was weak and nervous, and stated that she had suffered from pain in the right side of the head from the earliest period of her recollection, the pain being alternately acute and dull. She had also suffered from cutting pains in the region of the heart, and, on examination, this organ was found to beat in an irregular and intermittent manner. A discharge from the nose was of a muco-purulent character, and had a very offensive odor.

A probe passed along the floor of the nostril came in contact with an obstruction which was removed with some difficulty. It was found to be a well-preserved plum-stone covered

with calcareous matter to the extent of one-eighth of an inch. The patient at once called to mind the fact of having inserted it some 29 years before. In a short time, all her vague symptoms disappeared, and in six weeks she had gained greatly in weight and her health was better than ever before.

THE HYGIENE OF THE NOSE.

Dr. W. Freudenthal, in a letter to the editor of the New York Medical Journal, Aug., 1896, takes exception to certain advice offered in the article on "The Prophylaxis of Nasal Catarrh," published by Dr. Carl Seiler in the July 18th issue of that journal. (See Report of Proceedings of the American Laryngological Association, Annals of Ophthalmology and Otology, July, 1896, page 814.)

The suggestion which Dr. Seiler makes is to have a child taught to snuff up the nose a warm saline or alkaline solution as early as possible in life. Dr. Freudenthal states that it is not only unnecessary to syringe a perfectly healthy nose, but that this habit is not without its element of danger. He calls attention to the possibility of driving the solution into the frontal or ethmoidal cells when nasal obstruction is present.

A FATAL CASE OF SARCOMA OF THE NOSE.

Dr. W. Scheppegegrell reports the case of a patient who had suffered for several months from an irritation in his nose, which he thought was due to "catarrh." (The Laryngoscope, Aug., 1896.) An anterior rhinoscopic examination showed the left nostril filled with a granulation-like mass, which bled easily when touched with a probe, the mass being sessile and springing from the quadrangular cartilage; the septum on the right side was also partly covered with a similar mass, although no communication between the two nostrils could be found. The growth did not extend into the posterior nares. The removal of a small part of the tumor for rhinoscopic examination was followed by considerable hemorrhage. The diagnosis of round cell sarcoma was confirmed by a microscopic examination.

Contrary to the orders given him, the patient did not return to the hospital until a week later. The importance of an immediate radical operation was explained to him, but the fear of an operation prevented the patient from returning until four and one-half months had passed, when it was found that the disease had made marked progress. The forehead and region of the frontal sinus were dilated, showing that this region had

become infected, and there was marked exophthalmos. The nasal bone had been absorbed, and this region was covered with a large, soft swelling which extended to both sides of the face anteriorly; both nostrils were occluded with a sarcomatous mass, and by the rhinoscopic mirror the neoplasm could be seen in the naso-pharynx. The patient was very feeble and markedly cachectic.

As the case was pronounced hopeless, the patient visited a "cancer doctor," who gave him a paste and directed him to apply it to the diseased parts of his face, and not to remove it for three days. The patient tried to follow the advice, but after two days of excruciating pain, was compelled to remove the paste, and with it came all the superficial parts, leaving a large hole in which could be seen the teeth and part of the superior maxilla. On account of the opening through the cheek, the patient could take food only with the greatest difficulty, and he died ten days later from exhaustion.

The writer concludes by calling attention to the necessity of prompt surgical interference in these cases.

THE NASAL MUCOUS MEMBRANE; A PLEA FOR THE GREATER CARE OF IT IN INTRANSALE OPERATIONS.

In its normal condition, the nasal mucous membrane is of vast importance to the economy in its philosophical functions. Besides its part in respiration and in olfaction, is the important one of preventing ingress into the system of pathogenic micro-organisms. Its exposed condition and sensitive character, renders it especially subject to infectious disorders, hence, after repeated attacks of these micro-organisms, the protecting power of the membrane succumbs, and a diseased condition results. (Emil Mayer, New York Medical Journal, July, 1896.)

By far, the most frequent abnormalities of the anterior nares that rhinologists are called upon to treat, are diseased conditions of an obstructive nature, and the object must be to remove these in order to procure free access of the air into the posterior nares. For this purpose, various mechanical devices have been used, and it is in the selection of these that much care must be taken in order that the least injury possible to the mucous membrane should occur, for it has been shown how necessary that membrane is to the economy, and the unnecessary removal of any portion of the membrane should be avoided. The electro-cautery is a mere temporizing device, rarely curing anything, but chiefly destroying the mucous mem-

brane, and thus rendering it powerless for its chief physiological function. The only instance where the removal of the mucous membrane is not apt to be followed by distressing symptoms, is where it is redundant, as over the turbinated bodies. The author advises the cold wire snare as most efficacious in these cases.

(The cold wire snare is useful in cases in which the hypertrophy is localized, but in cases in which the hypertrophy is general, as, for instance, when covering the whole inferior turbinate, this instrument is difficult to apply, and its use would be questionable, even if it could be used for such cases. The method for treating hypertrophic rhinitis by electrolysis, as recommended by Flatau (*Wiener Med. Woch.*, No. 12, 1892), Scheppegrell (*New Orleans Med. and Surg. Journal*, Sept., 1892, *Annals of Opt. and Otol.*, April, 1896), and Garrigou-Desarenes (*Journal of Laryngology*, Oct., 1892), would here be advisable. By electrolysis, the reduction of tissue is sub-mucous, and this method is, therefore, conservative of the mucous membrane and its glandular elements. Scheppegrell.)

REMARKS ON PERFORATION OF THE NASAL SEPTUM.

Dr. Carl Seiler believes that perforation of the nasal septum, especially of its lower cartilaginous part, is not rare, but such cases are numerous, and the perforations, although unsuspected, and easily overlooked at a cursory examination, are often the real cause of a long train of symptoms known in a general way, as "nasal catarrh." (*Int. Med. Mag.*, *Med. Herald*). Such lesions are looked upon as pathognomic of syphilis; this may be true when the lesion exists at the upper bony part of the septum, yet is but rarely the cause when the lower or cartilaginous plate alone is perforated. Any frequently repeated and long-continued traumatism, though slight at each occurrence, may result in irreparable damage, and produce the condition. Take for example a case in which a depression exists on one side of the cartilaginous septum, produced by continued pressure of a hypertrophied lower turbinate, or by a localized projection of the nasal septum itself. Such a depression would be a favorable site for the accumulation and inspissation of mucous. A scab soon forms as a result of this drying, causing irritation to the patient, so that he endeavors to remove it either with the finger nail or by forcible blowing; slight bleeding follows expulsion of the scab. Such a traumatism may readily loosen the epithelium in the depression and

remove the natural covering of the parts and results in abrasion. Frequent repetition of even such a trifling loss of tissue must exceed the natural repairs, and thus gradually deepen the depression in the septum, which finally results in perforation. Another cause of perforation of the cartilaginous septum, is an excoriation or partial necrosis of the nasal mucous membrane so frequently observed in typhoid fever, as well as in nasal diphtheria. Rarely abscesses between the cartilaginous plates of the septum cause the lesion. The presence of foreign bodies is a more frequent cause, and, finally, unskillful or mistaken surgical interference for the removal of nasal obstructions may result in the formation of a perforation. Treatment must be based upon the peculiar pathological, anatomical and physical conditions, and upon the extent of the lesion. Scrupulous cleanliness, topical applications, and surgical measures, when necessary, constitute the lines of treatment. The most radical method is to perform a plastic operation by cutting out a piece of one of the plates of the cartilaginous septum, either above or below the site of perforation, large enough to cover it. The piece so removed, after denuding the edges of the perforation with a galvano-cautery knife, is held in place by plugs of wood or ivory covered with aseptic punk, or by means of delicate silk sutures introduced through the whole of the thickness of the cartilaginous septum. In certain cases the closing of the perforation between the two fossae may be secured by means of a hard rubber obturator, held in place by a set-screw or clamp, somewhat after the fashion of the modern sleeve-button. The objection to this device, however, is that it does not always favor healing of the denuded cartilage; simply covers up the opening, and consequently does not prevent further necrosis.

(As the simple perforation of the nasal septum usually gives rise to but little irritation, its existence being frequently unknown to the patient, surgical interference is rarely indicated. The operation above described would give rise to cicatricial tissue in the site from which the flap was made, which might be more irritating than the original condition. The obturator referred to would be difficult to apply, and would not only be more irritating than the condition which it is intended to remedy, but would probably tend to cause extension of the necrosis.—Scheppe-

THE ETIOLOGY OF OZENA AND ITS TREATMENT WITH SERUM.

In an editorial of the American Medico-Surgical Bulletin, July, 1896, attention is called to the experiments of Bellfanti and Della Vedova in the treatment of ozena with serum. These

investigators were prompted to undertake this work by the experiments of Fraenkel, Loewenberg and Abel, who believed that they had found the essential cause of the disease in a microbe, to which the latter gave the name of *bacillus mucosis ozenæ*. The micro-organism detected was found to bear a resemblance to the diphtheria bacillus and a pseudo bacillus, with which we are familiar, but are supposed to belong to another species of the same family.

The cases reported by Bellfanti and Della Vedova are 32 in number, in all of which the bacillus was found. On the whole number, 16 were completely cured (some have remained well for over two months), seven were greatly benefited and almost cured, four were only improved, and, for the remaining five, only a slight improvement was noticeable.

Professor Gradenigo, in the same journal in which these cases are reported (*Archiv. Ital. di Otol. IV.*, 1896), reports his own experience with this new application of the serum therapy. His results were less satisfactory than those of his colleague, but he believes that the new therapy is well worthy of a further trial. In his cases there were three instances of unpleasant reaction following the injections. Concerning the whole matter, as brought out by these observers, we may render the verdict: "important, if true," but there have been so many enthusiastic clinical reports published in the last few years, that have not afterwards been substantiated, that it renders us somewhat incredulous and makes us demand further proof.

The clinical state, which we know as ozena, with its crusts and horrible odor, is such a deplorable one, and has been obstinate to all medical measures, that anything offering relief should be thankfully welcomed and faithfully tried.

(In regard to the micro-organism, found in ozena, from which the serum is prepared, it should not be forgotten that many investigators claim that this bacillus plays the part of the effect in this disease, and has no etiological function. Presuming that the cases in which this method has been tried were limited to that well-defined clinical condition known as rhinitis atrophica fedita, and did not include a number of pathological conditions, as empyema of the accessory sinuses, syphilis, etc., in which ozena is simply a symptom, we should remember that this is essentially a chronic affection of long duration, and when it is claimed that some of the cases have remained well for over two months, we should certainly demand more conclusive evidence of cure. Ozena has more aggravated symptoms than the major-

ity of nasal affections, but the amelioration of these symptoms by proper cleansing and disinfecting washes is so rapid and remarkable, that the patient easily believes that he has been cured. The cure, however, we know to be as difficult as the amelioration is simple.—Scheppegegrell.)

THREE CASES OF PLASTIC NASAL SURGERY—FOR SADDLE-SHAPED NOSE, REMOVAL OF THE ENTIRE NOSE AND ARCHED ROMAN NOSE.

In the first case reported by Dr. W. W. Keen, the saddle-shaped nose was due to a fall which the patient had had 18 years before. It was corrected by the permanent insertion of a silver-gilt plate to support the collapsed part of the nose. (*Therapeutic Gazette*, July, 1896.)

In the second case, in which the entire nose was removed for sarcoma, the deformity was remedied by an artificial nose, first of aluminum and later of silver.

In the third case, the patient, aged 30, had sustained an injury to the nose six years ago, which rendered a congenital prominence still more marked, and which the patient claimed interfered seriously with his obtaining employment as a waiter. The operation to convert this markedly arched nose into a straight, or Grecian one, was as follows:

An incision was made to the bone from the tip to the base of the nose and the soft parts dissected loose on each side. With a drill, the bones of the nose were then penetrated to about the middle of their length. A piece of this shape (), about 22 mm. long, and at its widest part 5 mm. wide, was then removed. This made an opening into the interior of the nose. The attempt to crush the sides of the nose together with a pair of strong forceps being ineffectual, one or two blows of a hammer on a chisel, just at the juncture of the nose, fractured the two sides of the nose together. A straight needle with a stout thread of catgut was then passed through and held the bones in position. The cartilage, which had been partially removed, was then brought together in a similar manner and the incision of the skin was closed with Halsted's subcuticular sutures. The result was satisfactory as regards the shape, there being a good, straight nose, instead of the curved nose which the patient originally had. The scar is scarcely visible.

(It is to be regretted that the author does not make a comparative statement as to the functional capacity of the nose before and after the operation.—Scheppegegrell.)

ACCESSORY NASAL CAVITIES.

CURED POLYPI OF THE FRONTAL SINUS.

Dr. H. Tilley describes the case of a man aged 45 years, who complained of slight discharge from both nostrils and occasional frontal headache. (*Journal of Laryngology*, Aug., 1896.) Some polypi were seen under the middle turbinate on the left side, which were removed from time to time. A discharge of pus was also constantly seen in this situation. An examination of the maxillary antrum was made, but this was found healthy. A probe, however, could be easily passed into the frontal sinus. The patient was therefore anaesthetized and a vertical incision about two inches long made from the nasion upwards; the soft parts and periosteum were drawn aside, and the anterior surface of the left sinus removed by means of gouge and mallet, when the granulations contained in the sinus bulged forward and looked exactly like haemorrhoids of the rectum. The same was the case with the right sinus. Both sinuses were curetted, and then swabbed out with zinc chloride solution, and drainage tubes inserted into both sinuses, by means of which they were irrigated daily with boracic lotion for a week, when the tubes were removed. The wound healed and the patient is now perfectly free from any trouble, and there is no nasal discharge. The median scar is now almost invisible.

In the discussion of this paper, before the London Laryngological Society, Dr. Semon related a case which he had with Dr. Horsley, in which a transverse incision was made, a portion of the front of the sinus taken away and the whole mucous membrane removed. During this operation the hopelessness of operating through the nose was apparent, as it was impossible to get to the seat of the disease through the nose. He asked whether in these cases it would not be possible to fill up the sinuses with foil or something to prevent the falling in of the cavity. Dr. Spencer suggested plaster of Paris as being good for filling up bone, but Dr. Stewart said that this would be too heavy for the frontal sinus.

Dr. Dundas Grant mentioned a case in which decalcified bone was used to fill up a hole in the astragalus. He pointed out the difficulty of the bone healing without a drawing in of the cavity. Dr. Lack thought that the opening through the eyebrow caused no deformity. He considered it best to leave the mucous membrane untouched.

SOME NOTES ON TWO CASES OF SARCOMA OF THE NASAL CHAMBERS AND ACCESSORY SINUSES.

Dr. Arthur Bliss reports two cases. (New York Medical Journal, July, 1896.) In the first case the sarcoma had developed very extensively, having completely filled the left nares, and having forced the septum against the outer wall of the opposite side. The left eye-ball protruded from its orbit, and the posterior nares was filled so completely that the soft palate was pushed downward. The external auditory canal of the left ear was filled with a similar growth of tissue, and the maxillary antrum on the left side, which was opened through the fossa canina, was found to be packed tightly with a fungoid mass. There appeared to be no involvement of the cervical glands. The diseased tissue was removed by cutting forceps and well curetted and the site packed with iodoform gauze. Six weeks after the operation, the lymphatic glands, at the angle of the jaw, became enlarged and the child died of exhaustion six weeks later.

In the second case, the growth protruded from the left nares, there being marked exophthalmos and swelling of the cervical lymphatics of the left side. The general condition was wretched and it was not deemed advisable to attempt any operative procedure.

PHARYNX.**CHRONIC RETROPHARYNGEAL ABSCESS IN AN ADULT.**

Dr. Felix Semon reports the case of a man of 37, who eight months before had had an "abscess" in the throat which took about six weeks to develop, and caused at the time considerable difficulty in swallowing. (The Journal of Laryngology, Aug. 1896.) It was opened, a large quantity of matter escaped, and he was then sent on a sea voyage. The incision, however, never healed, and he is still troubled with much secretion, and has at the same time a feeling of dryness in the throat. There is an indistinct history of syphilis some years ago, but no secondary or tertiary symptoms have ever occurred.

An examination showed the posterior wall of the pharynx enormously swollen, sodden and reddened, and particularly the right side bulging forward. There is a longitudinal opening filled with sanious matter at the angle formed between the posterior and right lateral wall, and a small fistulous opening near the middle line. The probe introduced into these openings does not touch any rough bone. The swelling extends a long

way up into the naso-pharyngeal cavity, the movements of the head are particularly free, the vertebrae are not tender to touch at all; no evidence of pulmonary affection.

Iodide of potassium was administered without benefit. Should the abscess not close spontaneously in three or four weeks, Dr. Semon intends to connect the two openings by a horizontal incision at the lower part of the abscess, and to scrape out freely its walls. Such a case of a chronic retro-pharyngeal abscess in an adult, without any traumatic or diathetic cause known, is exceedingly rare.

TWO CASES OF AN ENLARGED ASCENDING PHARYNGEAL ARTERY SITUATED ON THE POSTERIOR WALL OF THE PHARYNX.

Dr. E. Harrison Griffin calls attention to the fact, that the pharyngeal artery may be in some cases, as large as the radial artery in the wrist, and at the same time, lie superficially in the pharynx so that its pulsations can be plainly seen and counted, and therefore, advises a rigid examination of the pharynx before such an operation as excision of the tonsils or even the opening of an ordinary quinsy, as an injury to this artery, when so situated and enlarged, would mean a copious hemorrhage. (Medical Record, Aug., 1896.) He reports two cases of this abnormality. In the first case, a large pulsating tumor was visible, situated on the right side of the pharynx, extending from its extreme end to almost its median line, in size about the volume of a lead pencil. It extended downward on the pharynx to a distance of an inch and a half. It gave no trouble whatsoever, the difficulty, which had caused the visit of the patient, being due to an acute attack of follicular tonsillitis.

In the second case, the artery was as large as in the case above described, and extended from above the margin of the soft palate, as far down as could be seen by depressing the tongue with the spatula. In this case also, the abnormal condition of the artery had given rise to no symptoms.

TORTICOLLIS DUE TO ADENOID VEGETATION AND CHRONIC HYPERTROPHY OF THE TONSILS.

Dr. Arthur J. Gillepe reports three cases of torticollis, two of which are classified as congenital or idiopathic wry-neck, and one is reported to show how readily this deformity was cured by the removal of the adenoid vegetation from the vault of the pharynx. (New York Med. Journal, Aug. 1, 1896.)

The first case was a boy aged seven, well nourished, bright and active, with the right sterno-cleido-mastoid muscle so much

contracted that the ear was within an inch of the shoulder; there was a marked asymmetry of the face and head. The mother stated that the child had had its head in an abnormal position since its birth, and that the deformity had gradually increased as it grew up. The child was a mouth breather, due to hypertrophy of the pharyngeal tonsil, the faucial tonsils being also enlarged. The removal of these hypertrophies was followed by marked improvement, but as structural changes had already taken place in the muscles, it was found necessary to divide the sterno-cleido-mastoid muscles. The head, placed in a corrected position, was supported by an ordinary Sayre's jury mast attached to a leather corset, which was worn for several months. There was no return of the deformity.

The second case was a baby 16 months old, who suffered from torticollis, which was aggravated when suffering from a slight cold. The vault of the pharynx was filled with adenoid growths. When these were removed, the child seemed to hold its head in a more abnormal position for a day or two, but this was afterwards followed by an improvement, both in the position of the head and the symmetry of the face.

The third case was not of the congenital variety. The child had suffered from early childhood from rickets, from which it had made a perfect recovery. When three years old, it developed a contraction of the sterno-cleido-mastoid muscle without fever or constitutional symptoms of any kind. The vault of the pharynx was found to be filled with adenoid vegetation, the removal of which was followed, within a few days, by entire cure of the deformity.

ON GARGLING ACCORDING TO THE METHOD OF VON TROTSCH.

Professor Guye of Amsterdam, referring to the suggestion by Lenox Browne to abolish gargling in the treatment of diseases of the throat, states that he is not of his opinion. (*Journal of Laryngology*, Aug., 1896.) He thinks it is due to the memory of Von Trotsch that this method is not described by Browne as first described by the former.

Von Trotsch described the following method: "Sit, or rather lie, down, with the head thrown back; take a mouthful of the gargle, and make the movements of swallowing without letting the liquid go down the throat." Mr. Browne says: "Take a mouthful—then, closing the nose with the finger and thumb to prevent entrance of air, open the mouth and make the movements of swallowing," etc.

The direction to close the nose was never given by Von Troltsch. Making the movement of swallowing whilst closing the nose with the finger and thumb, is to perform Toynbee's experiment, a method by which air is pumped out of the middle ear, and this method is very injurious to the ear, as shown by the fact that patients with impaired permeability of the nose are more deaf after each meal, and if this was Von Troltsch's method of gargling, it should be condemned; but this is not the case as shown above, and Professor Guye makes the suggestion "not to abolish gargling," but to use it as an adjunct to other treatment; to reserve, perhaps, Von Troltsch's method for chronic cases, and lastly to use only harmless ingredients.

(As the article by Lenox Browne on the abolition of gargling in the treatment of diseases of the throat has received very great attention and has been extensively copied by the medical journals, this statement by Prof. Guye on the correct translation of the Troltsch method, deserves special attention. Properly performed, Troltsch's method, although difficult, is a useful expedient for many chronic diseases of the pharynx, and especially of the naso-pharynx; but to perform it with the nose closed with the finger and thumb is impracticable and exposes the patient to the liability of irritating the ear, or of aggravating any already existing affection of this organ.—(Scheppegrell.)

THE TONSILLAR COUGH.

Dr. Foret states that this cough may result from any pathological alteration of the tonsils, and he explains this by the complex innervation of the gland. (*La Presse Medicale*, Med. Record, July, 1896.) In fact, the glosso-pharyngeal, the lingual, the spinal and the pneumogastric nerves are blended and become entangled at their outer surface, where they form a small plexus, which Andersch had described under the name of "tonsillar plexus." It must not be forgotten that the tonsils are enclosed by the muscles of the pillars of the fauces which are very distinctly connected with the muscular apparatus of the larynx.

Tonsillar cough is violent, spasmodic, and extremely painful. It is frequently accompanied by reflexes in the neighboring region, and particularly by watering of the eyes. It is distinguished from the cough due to affections of the respiratory tract by the complete absence of expectoration, and, owing to this fact, it does not yield to any of the remedies generally used.

REMARKS ON NASO-PHARYNGEAL INFLAMMATION.

Dr. J. Lewis Smith states that when naso-pharyngeal inflammation extends, as it often does, to the nasal sinuses, it is likely to be painful and sometimes dangerous. (American Med. and Surg. Bulletin, July, 1896.) The diseases in which acute naso-pharyngeal inflammation is of a microbic origin are as follows: influenza, measles, pertussis, scarlet fever, diphtheria and pseudo-diphtheria. Catarrh of non-microbic origin is generally produced by taking cold, or by the irritation of the dust, or other irritating substances, or foreign bodies in the nose.

As influenza, at the present time, appears to be expending its energy chiefly on the nasal passages, he thinks that much good could be done by the early and very frequent use of antiseptic irrigations. It is well to resort to these immediately upon the appearance of sufficient symptoms and before the diagnosis has been positively established. It is a particularly useful treatment for children.

THE LITHAEMIC THROAT.

Dr. J. W. Gaines states that lithaemic patients complain that their throats are sore, although they have not taken cold and have various symptoms not due to the presence of intra-nasal trouble. (Langsdale's Lancet, Sept., 1896.) In addition to the constitutional symptoms, we usually find one or more of the following conditions present:

1. Throat uniformly reddened and of a glazed appearance.
2. The condition formerly known as granular pharyngitis.
3. Some edema of the soft palate and pillars of the fauces.
4. Blood-vessels and throat dilated and tortuous.
5. A tenacious glairy secretion, generally scanty, covering the posterior wall of the pharynx.
6. The tongue coated or reddened with prominent papilla.

Posterior rhinoscopic investigation shows that the nasopharynx participates in the diseased condition.

LARYNX AND TRACHEA.**CASE OF THYROTOMY FOR EPITHELIOMA OF THE LARYNX.**

Dr. Felix Semon reports the case of a patient in which the whole of the left vocal cord, particularly in its middle part, was considerably tumefied, and showed a granular appearance. (The Journal of Laryngology, Aug., 1896.) The mobility of the vocal cord, however, was surprisingly free, and the hoarseness, comparatively speaking, very slight. The only symptom

of which the patient complained was hoarseness, dating back nearly one year and a half and supposed to have commenced after an attack of influenza. The diagnosis of malignant disease was made.

On opening the larynx the growth was seen to extend all over the left vocal cord, and the ventricular band also appeared somewhat swollen. In front, the growth extended to the median line. The whole affected portion was delineated by two semi-circular cuts at a distance of about three quarters of an inch from the growth, meeting in front and behind and cut with curved scissors. Posteriorly the extirpation extended to the front part of the arytenoid cartilage, which was also removed.

The patient made a good recovery, except that on the third day some black spots appeared in the wound, supposed to be due to infection from the purulent nasal discharge, with which the patient was affected. These spots were scraped out, and nothing further occurred. The voice is now fairly good, a ridge having formed in the situation of the left vocal cord, a quantity of granulation tissue has formed in the anterior commissure, and when this shall have been removed the voice will probably improve still more.

The present case (which is, moreover, remarkable by its complication with purulent nasal discharge, probably due to empyema of the right frontal sinus) shows that not every tumefaction which appears in the neighborhood, or in the situation itself, of the scar after an operation of this kind, ought to be at once considered to represent a recurrence of the disease. The formation of the granulation tissue is not limited to the interior of the wound, but also extends to the external scar, and is no doubt due to necrosis and sequestration of small portions of the completely ossified projecting angle of the thyroid cartilage. Granulations such as present now in the upper part of the wound also luxuriantly grew up from the lower parts. This, however, healed spontaneously and rapidly after elimination of two or three minute particles of necrosed cartilages, which were eliminated through the external wound, and the probability is, that the same will take place with regard to the parts in which granulations are still at present seen.

TRACHEOTOMY.

The necessity for performing tracheotomy may arise when the surgeon is unprovided with tracheotomy tubes. (Medical Record, Aug., 1896.)

The following suggestion in the Alabama Med. and Surg. Age, April, 1896, is therefore instructive. Disinfect a fairly large hair-pin and bend both ends at an acute angle at about the middle of their length. The ends of the branches may then be twisted into small hooks or rings to which tubes may be attached. The blunt end of the hair-pin is inserted in the trachea and the branches tied by tubes fastened behind the neck. This will serve until proper tubes can be procured. Failing a hair-pin, take a stitch on each side of the opening in the trachea with stout silk and tie the ends behind the neck. Any piece of iron or copper wire, of suitable size, may serve as well, or even better than the hair-pin.

FOREIGN BODIES IN THE LARYNX AND TRACHEA WITH REPORT OF A CASE RELIEVED BY TRACHEOTOMY.

Dr. Robert Glasgow reports the case of a sixteen year old girl who complained that she had swallowed a pin which had caused slight symptoms of dyspnoea, altered voice, and inclination to violent paroxysms of coughing. (Virginia Med. Monthly, April, 1895.) The head of the pin could be seen lying below the vocal cords in the trachea, but the shaft and point could not be seen.

The patient was inverted and the body violently shaken and snuff was given, all without success. The next day, the symptoms being more violent, a tracheotomy was performed. The lower operation was first attempted, but venous hemorrhage was so violent that the attempt was abandoned and the trachea was entered by dividing the crico-thyroid membrane and cricoid cartilage. A forceps bent at an angle of 45 degrees was now inserted, and the foreign body was removed. The pin was located three and one half inches below the tracheotomy wound, and therefore, was about three-fourths of an inch above the bifurcation.

(Inversion and succussion, undertaken before tracheotomy has been performed, are dangerous procedures in such cases. They were especially impracticable in the above case, in which the point of the pin was evidently imbedded in the tissues of the trachea. Scheppegegrell.)

REPORT OF A CASE OF TRACHEOTOMY IN A CHILD AGED 38 DAYS.

Dr. Lewis M. Anderson was called in to see a 38 days old child who was breathing with considerable difficulty, having crowing respiration and considerable cyanosis. (Archives of Pediatrics, Aug., 1896.) In spite of the treatment, the child

grew rapidly worse, and a few moments later, as the child stopped breathing, and artificial respiration being unsuccessful, a rapid tracheotomy was performed. The tube could not be permanently removed for 52 days. No membrane was found at any time, and the author believes that the case was one of acute edema of the larynx, although, on account of the size of the child, this diagnosis could not be confirmed by a laryngoscopic examination.

DISEASES OF THE TRACHEA, BRONCHI AND LUNGS TREATED BY INTRA-TRACHEAL INJECTION.

Dr. J. Lindley Barton believes that absorption of injected liquids by the lymphatics of the tracheal, bronchial and pulmonary mucous membrane, has been fully demonstrated by competent observers, who have also given their testimony to the ease with which injections are borne, and favors tracheal and bronchial medication as a palliation and as a curative measure. (Medical Record, Sept. 1896.)

The technique is as follows:

A syringe with an endolaryngeal tube holding four drachms, answers the purpose perfectly. The larynx having been sprayed with a two per cent. solution of cocaine, the patient is instructed to grasp the tongue with the right hand, to draw it forward, at the same time drawing back the head, and open the mouth as wide as possible. The operator with the laryngeal mirror in one hand and the syringe in the other, proceeds as though he were about to make a laryngeal application. As soon as the tube enters the cavity of the larynx, the epiglottis is pulled slightly forward, the patient is instructed to breathe, the cords separate, the tube enters the trachea, and the syringe is emptied of its contents. By pointing the instrument to either side, the bulk of the medication may be made to enter either the left or the right bronchus. (Would not the bending of the patient's body to one side or the other, assist in assuring the passage of the injected liquid into the right or left bronchus? W.S.)

If care is taken, when inserting the tube, to avoid touching the glosso-epiglottic, or the aryteno-epiglottic folds, inter-arytenoid space, each one of which seems to act as a cough center, irritation, caused by this procedure, will not be found to be as great as expected. After a little preliminary treatment, the cocaine spray may be discontinued.

The remedies employed should be soothing and the vehicle non-irritating, such as olive oil, cod liver oil, glycerine, mucin-

lage, or any of the petroleum oils. Solutions containing benzoin, eucalypti, menthol, etc., have proved efficacious in the author's hands.

The author claims for this method of medication the following advantages:

1. The remedy is applied directly to the mucous surface.
2. It immediately alleviates the most distressing symptoms, adding at once to the comforts of the patient.
3. In a certain number of cases, the antiseptic effect of the medicine is very pronounced as shown by the longer interval between the febrile attacks and by their lessened intensity when they do occur.
4. The tracheal and bronchial mucous membrane rapidly absorbs the medication, so that we may expect a general, as well as a local, effect.
5. We avoid disturbing the patient's stomach with nauseating doses or the shattering of his nervous system with opiates.
6. This method of alleviating the most distressing and annoying symptoms does not interfere, in the slightest degree, with any other line of medical treatment which may be deemed advisable.
7. In cases characterized by an atropic condition of the tracheal mucous membrane, or of pulmonary disease with cavitation leading to retention and decomposition of secretions, intrabronchial injection will remove the disgusting fetor of the breath subsequent to this condition.

CODEIN AND SWABBING THE LARYNX AS ADJUVANTS TO O'DWYER'S TUBE IN MEMBRANOUS CROUP.

Variot has found the tube effective in conquering the glottic spasm in certain kinds of diphtheritic laryngitis, removing the tube in three or four minutes, and assisting the nervous system to control the tendency to spasm by administering syrup of codein. (*Semaine Med. The Journal of the Amer. Med. Assn.*, July, 1896.) Bayeux has also found swabbing or scraping the larynx with the tube an effective method of treating very membranous diphtheria. As the tube is introduced the membranes dislodged fill it, and the child chokes, when the tube should be withdrawn. The effort to cough will then expel the loosened membrane. Some children have recovered after one operation; others have required another to complete the expulsion of the membrane or to conquer the glottic spasm. Out of the twenty-three children treated, nine recovered, three required tracheo-

tomy, and in nine the tube had to be left permanently. There were eight deaths, a mortality of 34.78 per cent. in the twenty-three cases.

THYROID MEDICATION IN GOITRE.

The Pharm. Institute of Budapest has been making a special study of this subject. The investigations are described in detail in the *Deutsch. Med. Woch.* (The Journal of the Am. Med. Ass'n, Aug. 15, 1896). The results briefly stated are: 1. The goitre in every case decreased in size. The patients lost in weight, some as much as one to two kilograms. 3. The amount of urine increased. 4. The elimination of nitrogen, especially, in the urine, increased. 5. Increased elimination of CLNa and of P_2O_5 . 6. The amount of uric acid excreted was much increased, especially in the first days of the treatment. We know that the amount of uric acid excreted increases with increased numbers of leucocytes. The latest researches have established the fact that thyroid medication increases the number of leucocytes, which accounts for the increased amount of uric acid. Until we are better acquainted with the chemic structure of the thyroid gland, it is not sufficient to explain this increase in the amount of uric acid by the assumption that it corresponds to the amount of deterioration of the nuclein basis (xanthin, hypoxanthin) in the thyroid gland. It is interesting to note that Baumann does not consider it settled that the thyroïdin which he discovered may not be some product of a nuclein acid.

DIPHTHERIA, ANÆSTHESIA, NEW INSTRUMENTS, ETC.

NASAL FEEDING IN DIPHTHERIA.

Dr. Henry Jackson states that intubation has great advantages over tracheotomy, and that in most hospitals the latter operation is performed only if intubation has failed. (*Archives Pediatrics*, July, 1896.)

The drawback to intubation is the difficulty of feeding the patient. In the Boston City Hospital, gavage, or forced feeding, has been in use for several years in the diphtheria wards. The method is as follows:

The child is carefully pinned in a basket so that it cannot move its arms; it lies on the back. Usually one nurse feeds the child; a close funnel, about four or five inches in diameter, is attached to a Jacques soft rubber catheter with intervention of

a plain close tube. The catheter should be from seven to fifteen F., according to the age of the patient, the larger sizes being the most desirable. The well-oiled catheter is passed quickly, but quietly, along the floor of the nostril. Just as it passes into the esophagus there is usually slight resistance and gagging, otherwise no trouble is found. A small amount of water is allowed to flow down, and without allowing any air to enter, the milk and medicine are poured into the infant. At the end of the feeding, again a little water is given.

Children are, usually, perfectly quiet as soon as the tube has been passed, and many children take food, in this way, as quietly as from a nursing bottle. In withdrawing the catheter, it should be pinched that the few drops remaining may not flow out and irritate the pharynx.

ANESTHESIA AS EMPLOYED FOR OPERATIONS ON THE THROAT AND NOSE.

Dr. W. G. Holloway divides the operations requiring anaesthesia into three classes: (1) Those which only require a period of anaesthesia not exceeding 45 to 50 seconds; (2) Those which require anaesthesia up to one, one and a half, or two minutes at most; (3) Major operations, for which deep and prolonged anaesthesia has to be maintained. (*Med. Magazine*, June, 1896, *Journal of Laryngology*, Sept., 1896.) The anaesthetic invariably employed by him for operations in the first of these divisions is nitrous oxide gas, which is supplemented by the administration of a small quantity of ether vapor for those in the second class. Chloroform is given in preference for the major operations.

The objections, which have been frequently made to the use of nitrous oxide gas for tonsilotomy, removal of adenoids, etc., from the point of view that its effects are so transient and the period of anaesthesia so short, that the operator cannot finish the operation satisfactorily before the patient recovers consciousness, are discussed; and (to confute this opinion) very strong evidence in favor of its efficiency is produced by the author, who appends a table of over 4500 cases, extending over a period of four years, in all of which either gas alone or gas supplemented with a small quantity of ether vapor, was given satisfactorily and without untoward results.

The upright position for the operation is preferred, and the advantages of this position are enumerated. He considers the recumbent position dangerous, from the increased difficulty in

operating safely and satisfactorily on the part of the surgeon, combined with the risk to the patient of blood gaining entrance into the larynx and trachea, throat and nose, and in support of this statement, the author appends a table recording 15 deaths from chloroform reported in the medical press since 1892.

(It is to be regretted that the many advantages of ethyl bromide are not discussed in connection with the minor operations of the nose and throat. This agent has been found very effective in these cases and it is now extensively used. Nor is the possibility of a fatal issue from the use of nitrous oxide referred to. A fatal case from its administration was recently reported in the Druggist's Circular, a young woman dying under the anaesthesia which had been given for the removal of four teeth. The same patient had taken nitrous oxide on a previous occasion without feeling any bad effects from its action. Scheppegegrell).

EUCAINE AS A LOCAL ANAESTHETIC.

Dr. Gaetano describes eucaine as possessing the properties of cocaine as a local anaesthetic, but as having less toxic effects. Eucaine has no effect upon the pupil, and this may be of practical importance to ophthalmology, as a dilated pupil is an impediment to the performance of many operations upon the eye. (Robert Brudenell, *Lancet*, July, 1896.)

Eucaine has been used successfully in dentistry and laryngology, and solutions may be injected hypodermically without injury. It is said that the solution of the hydrochlorate of eucaine may be sterilized by boiling again and again, if necessary, without undergoing decomposition or suffering any deterioration of quality.

(Eucaine hydrochlorate has the following chemical constitution: $C^{10} H^{27} NO^4 HCL$. It is not decomposed by boiling with water, thus losing its efficacy as a local anaesthetic, as is the case with cocaine.

The advantages claimed for eucaine are, that the heart is in no way influenced by it; that the anaesthesia is more extensive in area and lasts longer than cocaine; that 30 grains of eucaine may be injected without danger, while the safely limit for cocaine is one-sixth grain; that solutions of 1:6½ in sterilized water are permanent at ordinary temperatures, without the addition of salicylic or carbolic acid, and that they do not become flocculent as is the case with solutions of cocaine. Scheppegegrell.)

COCAINE APPLIED TO THE MUCOUS MEMBRANE OF THE NOSTRILS A SPECIFIC FOR NAUSEA.

Dr. Charles W. Ingreham states that if a cocaine spray is forced well up into the nasal passages, effecting complete anaesthesia of the mucous membrane governing the sense of smell, more or less complete relief may be expected to follow in nine out of ten cases of nausea. (The American Medico-Surg. Bulletin, Aug., 15, 1896.) The effect in this treatment is explained on a strictly physiological basis. There is a strong nervous association between the olfactory nerves and the nerves of the gastric membrane. Repulsive odors inhaled are often reflected into the stomach, causing a sensation of nausea. This principle is involved also in the application of cocaine to the nasal membrane during the administration of chloroform, which is claimed to relieve the patient of many unpleasant accompanying and after effects, particularly gastric disturbances. Great care should be exercised to protect against the well known danger of idiosyncrasy, as well as to guard against the subject's acquiring the habit, particularly if its use is to be long continued.

The strength of the solution must be varied to meet the requirements of the individual case, but a two and a half per cent. solution will usually meet the desired effect, which will generally last several hours.

(As eucaine has been found to be as efficacious for local anaesthesia as cocaine, but without its constitutional ill effects, this preparation would probably be more useful in controlling nausea than cocaine. Scheppegrell.)

THE USE OF PEROXIDE OF HYDROGEN IN DISEASES OF THE NOSE, THROAT AND EARS.

Dr. W. Scheppegrell states that peroxide of hydrogen is one of the most useful agents which we have for the treatment of diseases of the nose, throat and ear. (Medical Record, Aug. 8, 1896.) It is not a toxic preparation, and, as an example of this, he describes a case in which a patient, from a misunderstanding of the directions, took six or eight four-ounce bottles of peroxide of hydrogen without any ill effects. It is one of the most useful agents in ozena, and has given him such good results in membranous rhinitis, that he has not found it necessary to use anti-toxine in such cases. It is an important agent in specific necrosis of the nostril and also in diseases of the accessory sinuses. In follicular and other forms of tonsillitis, it has great utility, and few physicians, in this locality, treat a case of

diphtheria without the application of peroxide of hydrogen, either with or without the anti-toxine.

He then describes the case of a little patient suffering from diphtheria with stridor and dyspnoea in which the tube which was inserted was repeatedly coughed out, and which was cured by the injection of a 75 per cent. alkaline solution of peroxide of hydrogen into the larynx by means of a laryngeal syringe. Peroxide of hydrogen is also a non-irritating antiseptic wash in suppurative diseases of the ear, whether of the tympanum, auricular canal or the mastoid cells.

EXAMINATION FOR TUBERCLE BACILLI.

Rhindfleisch of Wurzburg recommends the following method of examining sputum for tubercle bacilli, believing the greatest number of bacilli occur in the liquid instead of in the solid constituents of the sputum. (*Duetsche Med. Woch.*, New Eng. Med. Monthly, Aug. 1896.)

Dip a new clean camel's hair brush in water so as to moisten it and then press out the surplus water. With this brush stir the sputum well and then withdraw it. Although nothing will apparently cling to it, in reality it will be full of the bacilli, if they be present. Now stroke the cover glass lightly with the brush so as to form a thin uniform layer over it, and then proceed as usual in staining. A new brush should be used each time, as he found it almost impossible to entirely rid a once used brush of a few bacilli, which would, of course, invalidate subsequent examinations.

ORIGIN AND TREATMENT OF CERTAIN COUGHS DUE TO THROAT DISEASES.

Dr. Samuel G. Dabney states that cough may be due to a number of pathological conditions of the throat (*Louisville Med. Monthly*, Aug., 1896). Among these, he enumerates elongated uvula, enlargement and deep seated inflammation of the faucial tonsils, hypertrophy of the lingual tonsil, acute and chronic laryngitis. In addition to these causes, cough may be also due to adenoid growths in the naso-pharynx and chronic follicular pharyngitis. He advises the usual surgical treatment and in addition, careful attention to the general health, especially to the digestive system.

"SPITTING" IN INDIANA.

The Indiana State Board of Health has issued a circular letter to all railroad officials asking them to have ejected from their trains every man who persists in spitting on the floor of the cars

or stations after he has been warned not to do so. (The Journal of the Am. Med. Assn., Aug., 1896.) In the circular the board explains that the sputum contains the germs of la grippe, nasal catarrh, and various other diseases. It also declares that "spitting is a nasty and unnecessary habit," and explains that the Board of Health will pass a rule against spitting which will have all the force of law if the railroads will post it up and endeavor to enforce it. The circular adds: "When the rule is first published and posted up in public places this board will, of course, be loudly abused as foolish, impracticable and idiotic. Attention thus being gained, we will publish in every county reason for the action." Such a reform as the Indiana health officers have undertaken is needed in every part of the United States.

NEW SNARES FOR POST-NASAL AND INTRA-NASAL SURGICAL OPERATIONS.

Dr. J. E. Schadle has devised a modification of Dr. Jonathan Wright's snare which is shown in the illustration, fig. 1 (Medi-

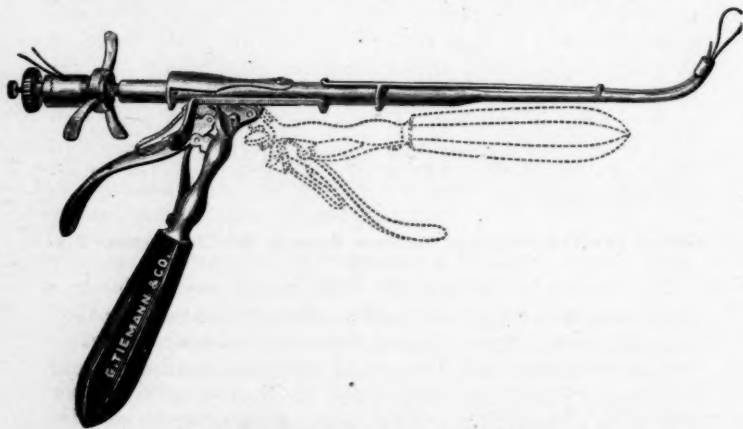


Fig. 1. Dr. Schadle's Post-nasal Snare.

cal Record, July, 1896). The ratchet mechanism is practically the same as in the Wright snare, but has much stronger capings (i and z) to work the ratchet. In fact, the whole instrument is much stronger and heavier, and for this reason is adapted for snaring fibroids of the naso-pharynx, for which purpose it has been devised. Either number five or number six piano wire could be used with this instrument. The wire fas-

tener (d) consists of a screw cap (e) the articulating surface of which is transversed by deep longitudinal grooves which fit into the counter grooves in the end of the shaft; when the cap is screwed down, the ends of the wire to be fastened passes between and at right angles to these grooves.

This instrument is also armed with a tempered steel lance (j) with a curved end. This runs through bands on top of the wire carrier for the purpose of transfixing the growth, if so desired, and is shot into place by means of a thumb lever (m) worked by the same hand that is holding the snare. It has also a windlass arrangement (9) just in front of the wire fastener, which is adapted to help out the ratchet in facilitating either a fast or a slow snaring. After repeated trials and alterations, the post-nasal curve as seen in the figure was perfected. This modification is also particularly adapted to the removal of adenoid vegetations. Fig. 2 represents a snare constructed for intra-



Fig. 2. Dr. Schadle's Nasal Snare.

nasal work. The wire carrier is made a double cannula that will carry the transfixion dart, or wire, in either chamber so that a right or left hand snaring can be done with the same instrument. The wire carrier is of a size that can be passed with ease, being but little larger in calibre than an ordinary Eustachian catheter. The wire fastener works on the same principles as the one described above, only it is at the side rather than at the end of the tube. By means of the movable cannula at the proximal end, to which the wire is fastened, and of the windlass, this snaring adapts itself to slow or rapid snaring.

These instruments are manufactured by Geo. Tiemann & Co., New York City, N. Y.

A HANDY FORM OF HOT SNARE FOR TONSILOTOMY.

Dr. Henry Gradle claims that the galvano-cautery snare is the best instrument for the removal of the tonsils, because it acts very efficiently, prevents bleeding and removes a larger portion than is usually effected with the guillotine. (The Journal of the American Med. Ass'n, Sept., 1896.)

The object of Dr. Gradle's snare is to obviate the loss of time incurred in wiring the hot snare of the instrument in ordinary use.

It consists of a handle made of two parallel brass bars, 11 cm. long, mounted in rubber blocks at both ends. Fig. 3. A third rubber block slides along the bars when guided by the fingers inserted through the rings on the block, while the thumb rests in the ring at the rear end of the handle. The sliding block holds two insulating steel stylets, which when pushed forward, pro-

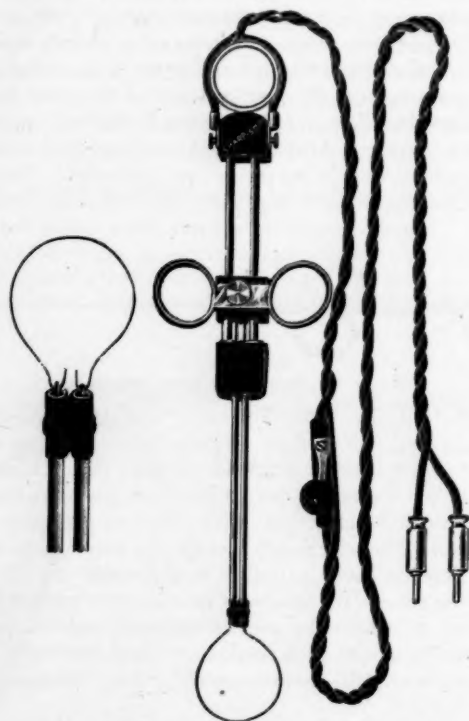


Fig. 3. Dr. Gradle's Hot Snare for Tonsillotomy.

trude through the two cannulae in front of the handle just far enough to allow a wire to be slipped through the eye in each stylet. The two cannulae, 9 cm. long and 2.5 mm. thick, are insulated by separation along their length, and by a soft rubber tube slipped over the end, while their ends are strengthened by wire wound around the rubber insulation. Steel (piano) wire is a better material for the loop than platinum, on account of its

stiffness. The instrument can be used with a loop nearly 11 cm. in circumference, but this size is rarely required. If a few suitable lengths of wire are prepared with their ends bent sharply, as shown in the accompanying cut, the burnt or softened wire can be replaced in a few seconds.

As shown in the figure, the current enters the instrument through the cords permanently attached beside the rear ring, passes along the brass bars to the stylets directly through metallic contact in the front block, as well as indirectly through the cannulae to the stylets and wire loop.

Good connection is thus assured. He has not been able to devise a better place for the key which establishes the circuit than in the length of the cords twelve inches from the handle. Experience in over 25 operations has taught him that this arrangement is a practical one. The hand which seizes the tonsil with the tenaculum (put through the wire loop) presses the button as soon as the loop is in place.

This instrument has been made for him by Messrs. Sharp & Smith of Chicago, Ill.

(Dr. Gradle's hot snare is certainly an improvement over the ordinary galvano-cautery snare, in that it avoids the delay and inconvenience of passing the wire through the cannulas to the handle, as in the old instruments. The key for establishing the circuit in the cable is, however, inconvenient and does not compare, from a practical standpoint, with the foot-switch which is now used for that purpose. Scheppegrell.)

THE X-RAYS IN DIAGNOSIS.

Experiments in applying the Roentgen method to the thorax, now under way, appear to indicate that we shall soon be able to discriminate many pulmonary and cardiac lesions, by means of the new method, in cases in which the older means of physical exploration leave the observer in doubt. (Phil. Poly-Clinic, Aug., 1896.)

(The application of the X-Rays for medical and surgical diagnosis has made considerable advances in Europe, especially in the hospital under the charge of Prof. Buka. In this hospital, the method of examining a patient, except in cases involving only a hand or a foot, is as follows:

In the wall of an absolutely dark room an aperture has been cut about the size of a man's body standing upright. This aperture has been covered with black pasteboard, which is completely light-proof. The patient stands outside of the dark room

with his face or back against this pasteboard screen. A powerful Crookes tube generates the rays in such a position that the patient's body is interposed between them and the screen. The examining surgeons take their places in the dark room.

The examiners, each with a small barium screen, which they use in the same manner as a reading glass, look through the pasteboard partition, which is transparent to the Roentgen light, and into the body of the patient, which is semi-transparent, with the exception of the bones. The patient is dressed and standing on the other side of an opaque barrier, yet his skeleton is sharply and exactly outlined before the physicians, who themselves are in darkness. Not only are the ribs, spine, skull and jaw-bone plainly visible, but the internal organs, the heart, liver, etc., are shown in faint outline and can readily be traced. If it is desired to examine some one spot with particular care, it is necessary only to move the Crookes tube to a position directly opposite. Scheppegrell.)

FURTHER OBSERVATIONS UPON THE TREATMENT OF MALIGNANT TUMORS WITH THE TOXINES OF ERYSIPELAS AND BACILLUS PRODIGIOSUS.

Dr. William B. Coley, after describing the methods by which the toxins are prepared, reports a number of successful cases, among which the following is of interest to our specialty, being a second recurrent sarcoma of the neck, with large secondary sarcoma of the tonsil. (Bulletin of the Johns Hopkins Hospital, Aug., 1896.)

Last operation performed by Dr. William T. Bull, March, 1891. The tumor was so extensive that only a portion could be removed: The general condition of the patient, May 4, 1891, was so bad that he was expected to live but a short time. He could swallow no solid food, and liquids with difficulty. He was treated from May 4 until Oct. 8, 1891, with repeated local injections of living cultures of the streptococcus of erysipelas. Decided improvement followed the injections, and whenever they were discontinued for a short time, the growth increased in size.

On Oct. 8th, a severe attack of erysipelas was produced by using a new and more virulent culture. During this attack, the tumor of the neck nearly disappeared; the tumor of the tonsil decreased in size; the general condition of the patient rapidly improved, and he had soon gained his usual health and strength. He has had no treatment since. He was last seen in Sept., 1895, four years later, at which time the tumor of the tonsil, though still present, had greatly shrunk in size; there was a

small mass at the side of the old scar in the neck, apparently made up of cicatricial and fibrous tissue.

The author's conclusions are:

1. That the mixed toxins of erysipelas and bacillus prodigiosus exercise an antagonistic and specific influence upon the malignant tumors, which influence, in a certain portion of cases, may be curative.

2. That the influence of the toxins is very slight in most cases of carcinoma, including epithelioma, most marked in sarcoma, but that it varies greatly with the different types, the spindle-celled form being, by far, the most responsive to the treatment.

3. That the action of the toxins is not merely local in character, but systemic.

4. That the toxins should be reserved for use in clearly inoperable cases of sarcoma, or in cases after primary operation, to prevent recurrence.

SOME RECENT PAPERS UPON THE VALUE OF
ANTITOXIN IN DIPHTHERIA, FROM
AMERICAN MEDICAL JOURNALS.

ABSTRACTED BY HANAU W. LOEB, A. M., M. D.,
ST. LOUIS.

THE REPORT OF THE AMERICAN PEDIATRIC SOCIETY'S COLLECTIVE
INVESTIGATION INTO THE USE OF ANTITOXIN IN THE TREAT-
MENT OF DIPHTHERIA IN PRIVATE PRACTICE.¹

The report is the result of a circular letter distributed through members of the Association, asking for information on the following points: Age; previous condition; duration of disease when the first injection was made; the number of injections; the extent of the membrane—tonsils, nose, pharynx and larynx; whether or not the diagnosis was confirmed by culture; complications or sequelae, viz., pneumonia, nephritis, sepsis, paralysis; the result; and remarks, including other treatment employed, the preparation of antitoxin used, and general impression drawn from these cases. Thirty-six hundred and twenty-eight cases from six hundred and fifteen different physicians were reported, of which two hundred and forty cases were excluded from the statistical tables, by reason of the fact that the disease was confined to the tonsils and the diagnosis was unconfirmed by culture. The remaining cases presented clear evidence of being true diphtheria. They were observed in 114 cities, in 15 States, the District of Columbia and Canada.

On the whole, the type of diphtheria seemed as severe as the average. In 593 cases the tonsils alone were involved; in 1397 the tonsils and pharynx, the tonsils and nose, the pharynx and nose, or all three, were affected. In 1256 the larynx was affected alone, or with the tonsils, pharynx and nose.

In many instances, the serum was used late in the disease; some dreaded the effects and others objected to the expense.

¹ Reported at the Eighth Annual Meeting held at Montreal, Canada, May 26, 1896.

The result, as influenced by the time of injection, is shown by the following table:

	Injected 1st Day.		Injected 2nd Day.		Injected 3rd Day.		Injected 4th Day.		Injected on or after 5th Day.		Date of injection unknown.		Total.	
	Cases.	Per cent Mortality.	Cases.	Per cent Mortality.	Cases.	Per cent Mortality.	Cases.	Per cent Mortality.	Cases.	Per cent Mortality.	Cases.	Per cent Mortality.	Cases.	Per cent Mortality.
Committee's Report.....	764	4.9	1065	6.3	620	12.7	336	22.9	390	88.9	215	7.0	3384	13.0
New York Health Board	126	8.7	215	12.0	228	16.6	153	20.9	208	29.0	17	23.5	942	17.8
Chicago Health Board	108	.0	336	1.5	660	2.7	269	14.1	97	34.0	0	0	1468	6.4
Total.....	996	4.9	1616	7.4	1508	8.8	758	20.7	690	85.3	232	8.2	5794	12.3

Of these, 213 were moribund at the time of injection, or died within 24 hours of first injection. Excluding these, the mortality is 8.8 per cent.

The percentage of mortality in the cases where the injection was used during the first three days of the disease was 7.3. Deducting the before mentioned class, it is only 4.8. The figures emphasize the statement that antitoxin is of little service after the third day, though striking improvement resulted occasionally when used as late as the fifth or sixth day.

Influence of Bacteriological Diagnosis upon the Statistics. In cases unconfirmed by bacteriological diagnosis, the mortality is five per cent higher than in the confirmed cases. The committee explains this difference on the score of the exclusion of tonsillar cases not confirmed by bacteriological examination, and the hesitation of country practitioners to use the antitoxin in the cases classed under this group.

The Results as Modified by Age of the Patients. The highest mortality (including the New York Board of Health and the committee's report) is found in patients under 2, being 23.3. After the second year, there is a steady decline in the mortality. The committee insists that the serum is of benefit in adult cases. Of 359 cases over fifteen years of age, there were but 13 deaths, of which four were moribund, two over 60, crippled by previous organic disease, and none living twelve hours after injection. Deducting the moribund cases, the mortality is 2.5 per cent.

Paralysis. Out of 3384 reliable reports, paralytic sequelae appeared in 328, or 9.4%. Of the 450 cases which died, paralysis was noted in 52, or 11.4%. The committee considers while in the report paralytic sequelae are slightly more uncommon than

where antitoxin is not used, cases of late cardiac paralysis are common enough; however, many of these would undoubtedly have succumbed earlier in the disease from suffocation and diphtheritic toxemia, if antitoxin had not been used. The following shows the character of the paralysis in the recovered and the fatal cases, and the date of injection:

RECOVERY CASES.	DAY OF INJECTION.						
	Cases.	1st Day.	2nd Day.	3rd Day.	4th Day.	5th Day.	Unknown.
Paralysis mentioned (variety not specified).	132	8	32	32	19	16	23
Throat only (aphonia), nasal voice or regurgitation.....	114	16	21	25	11	16	24
Extremities.....	14	3	5	2	..	3	1
Ocular.....	11	..	4	3	1	2	1
General (multiple neuritis)	4	..	1	2	1	..	..
Sterno-mastoid.....	1	..	1	..	..	..	..
FATAL CASES.							
Paralysis mentioned (variety not specified).	9	..	3	2	1	2	1
Cardiac, late after throat clear (in four of them throat also).....	32	1	2	8	9	8	4
Throat only.....	6	..	2	..	..	..	4
General late.....	4	..	1	..	1	2	..
Muscles of respiration.....	1	..	1	..	..	..	..
Totals.....	328	28	73	76	43	49	58

Sepsis was present in 10.7 per cent of the 3384 cases, and in 145, or 33 per cent of the fatal cases.

Nephritis. Reports upon this complication are unsatisfactory; they indicate its presence in 350, or 10 per cent of the cases. As an examination of the urine was not made in half the cases, the figures are naturally inaccurate. In fifteen cases renal disease was specified as the cause of death; in 9 the nephritis occurred late in the disease, and in 15, evidence of severe nephritis was conclusive.

Broncho-pneumonia was reported present in 193, or 5.9 per cent of the cases, a small number when compared with hospital statistics. It was found in 79, or 17.5 per cent of the fatal cases.

Laryngeal Cases. The larynx was involved in 1256, or 37.5 per cent. This proportion is unusually large, because several physicians reported laryngeal cases alone. Altogether, 379 physicians made report of laryngeal cases. No operation was performed in 691, or slightly more than half, and of these 128 died. In 48 death was due to the laryngeal obstruction, and the remaining 80 died of other complications. In 563, therefore, or

16.9 per cent of the whole number, the larynx was involved, and yet recovery took place without operation. In many of these the severe symptoms of stenosis disappeared after the use of serum, without intubation, and this circumstance was most remarked by the observers, and in establishing the value of the serum, the value of the antitoxin in checking the rapid spreading of the membrane down the respiratory tract, has been attested by the observations of more than 350 physicians submitting reports.

Operations were performed in 565, or 16.7 per cent of the entire number reported. Intubation was performed 533 times, with 138 deaths, or a mortality of 25.9 per cent, including 9 cases in which a secondary tracheotomy was performed, with 7 deaths. In 32 tracheotomy alone was done, with 12 deaths, or 37.4 per cent; 66 of the operative cases were either moribund or died within 24 hours after the operation. Deducting these, the results are 84 deaths, 16.9 per cent.

Of 5546 intubations in the practice of 242 physicians, collected by McNaughton and Maddren (1892), the mortality was 69.5 per cent. Since then the statistics have slightly improved, Brown's results being 51.6 per cent of deaths out of 279 cases.

The following exhibits some of the individual results of intubation:

Neff, New York.....	27	operations	27	recoveries.
Rosenthal, Philadelphia.....	18	"	16	"
Booker, Baltimore.	17	"	17	"
Seward, New York.....	8	"	8	"
McNaughton, Brooklyn	72	"	48	"
O'Dwyer, New York.....	30	"	20	"

These figures do not adequately show the good effect of antitoxin in laryngeal cases, as only half of the cases required operation.

The great preponderance of intubation over tracheotomy operations shows how much more highly the profession in this country esteems the former operation.

A Study of the Fatal Cases. Of the 450 fatal cases, 229, or one-half, received their first injection on or after the fourth day, and 152, or one-third of these, on or after the fifth day. In 58 instances the child was moribund at the time of injection, which was used without the slightest hope of benefit.

The cause of death was pretty accurately determined in 350 cases, the most important of which are the following:

Sepsis (including diphtheritic toxemia).....	105
Cardiac paralysis	53
Broncho-pneumonia	54
Laryngeal diphtheria	48
Diphtheritic tracheitis, or bronchitis.....	11
Sudden obstruction of intubation tube.....	3
Asphyxia from coughing up of tube.....	3
Died on table during tracheotomy.....	1
Nephritis	15
General paralysis	5
Paralysis of the respiratory muscles.....	1
Measles	6
Scarlet fever	6
Gangrene of the cervical glands.....	2
Endocarditis	1
Diphtheritic inflammation of tracheal wound.....	1
General tuberculosis	1
Exhaustion	3
Convulsions	3
Meningitis	1

The kind of antitoxin used in order of frequency, is as follows: 1, New York Board of Health; 2, Behring's; 3, Gibier's; 4, Mulford's; 5, Aronson's; 6, Roux.

Dosage and Number of Injections. In the great majority of cases only one injection was used; occasionally two or three were given. The largest number of injections, 18, were given by Weimer (Chicago) to a child thirteen years old.

In only nineteen cases where the serum was used during the first three days, did it appear to have no effect, the disease ending fatally. The committee reports these in some detail to show to what degree they may be regarded as a test.

Unfavorable Symptoms from Antitoxin. Only three cases can be considered as showing unfavorable symptoms due to the antitoxin.

Case I, by Kortright, Brooklyn: Died of convulsions ten minutes after injection 1st day, with 10 c. c. of Behring's serum.

Case II, by Kerley, New York: Injected with 10 c. c. New York Board of Health serum on 4th day. The child, who was not very sick, became distinctly worse, temperature rose; death from exhaustion four days later.

Case III, by Eynon, New York: "A rapid nephritis developed after the second injection, causing coma, convulsions and death twenty-four hours after the first injection.

The report concludes with the following summary:

(1) The report includes returns from six hundred and fifteen physicians. Of this number more than six hundred have pronounced themselves as strongly in favor of the serum treatment, the great majority being enthusiastic in its advocacy.

(2) The cases included have been drawn from localities widely separated from each other, so that any peculiarity of local conditions to which might be ascribed the favorable reports must be excluded.

(3) The report includes the record of every case returned except those in which the evidence of diphtheria was clearly questionable. It will be noted that doubtful cases which recovered have been excluded, while doubtful cases which were fatal have been included.

(4) No new cases of sudden death immediately after injection have been returned.

(5) The number of cases injected reasonably early in which the serum appeared not to influence the progress of the disease was but nineteen, these being made up of nine cases of somewhat doubtful diagnosis; four cases of diphtheria complicating measles, and three malignant cases in which the progress was so rapid that the cases had passed beyond any reasonable prospect of recovery before the serum was used. In two of these the serum was of uncertain strength and of doubtful value.

(6) The number of cases in which the patients appeared to have been made worse by serum were three, and among these there is only one new case in which the result may fairly be attributed to the injection.

(7) The general mortality in the fifty-seven hundred and ninety-four cases reported was 12.3 per cent; excluding the cases moribund at the time of injection, or dying within twenty-four hours, it was 8.8 per cent.

(8) The most striking improvement was seen in the cases injected during the first three days. Of forty-one hundred and twenty such cases the mortality was 7.3 per cent; excluding cases moribund at the time of injection or dying within twenty-four hours, it was 4.8 per cent.

(9) The mortality of fourteen hundred and forty-eight cases injected on or after the fourth day was 27 per cent.

(10) The most convincing argument, and to the minds of the

committee an absolutely unanswerable one, in favor of serum therapy, is found in the results obtained in the twelve hundred and fifty-six laryngeal cases, (membranous croup). In one-half of these recovery took place without operation, in a large proportion of which, the symptoms of stenosis were severe. Of the five hundred and thirty-three cases in which intubation was performed the mortality was 25.9 per cent, or less than half as great as has ever been reported by any other method of treatment.

(11) The proportion of cases of broncho-pneumonia—5.9 per cent—is very small, and in striking contrast to results published from hospital sources.

(12) As against the two or three instances in which the serum is believed to have acted unfavorably upon the heart, might be cited a large number in which there was a distinct improvement in the heart's action after the serum was injected.

(13) There is very little, if any, evidence to show that nephritis was caused in any case by the injection of serum. The number of cases of genuine nephritis is remarkably small, the deaths from that source numbering but fifteen.

(14) The effect of the serum on the nervous system is less marked than upon any other part of the body, paralytic sequelae being recorded in 9.7 per cent of the cases, the reports going to show that the protection afforded by the serum is not great unless injections are made very early.

The committee feels that this has been such a responsible task that it has thought best to state the principle which has guided it in making up the returns. While it has endeavored to present the favorable results with judicial fairness, it has also tried to give equal, or even greater, prominence to cases unfavorable to antitoxin.

In conclusion, the committee desires, in behalf of the society, to express its thanks to members of the profession who have cooperated so actively in this investigation, and to Dr. A. R. Guerd for the preparation of the statistical tables.

(Signed)

L. EMMETT HOLT, M. D.,
W. P. NORTHUP, M. D.,
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SAMUEL S. ADAMS, M. D.

THE ACTION OF THE SOCIETY UPON THE REPORT.

At the close of its presentation the society voted to accept the report of the committee, and after a full discussion it was decided to embody its conclusions in the following resolutions:

(1) Dosage. For a child over two years old, the dosage of antitoxin should be in all laryngeal cases with stenosis, and in all other severe cases, fifteen hundred to two thousand units for the first injection, to be repeated in from eighteen to twenty-four hours if there is no improvement; a third dose after a similar interval, if necessary. For severe cases in children under two years, and for mild cases over that age, the initial dose should be one thousand units, to be repeated as above, if necessary; a second dose is not usually required. The dosage should always be estimated in antitoxin units, and not of the amount of serum.

(2) Quality of antitoxin. The most concentrated strength of an absolutely reliable preparation.

(3) Time of administration. Antitoxin should be administered as early as possible on a clinical diagnosis, not waiting for a bacteriological culture. However late the first observation is made, an injection should be given, unless the progress of the case is favorable and satisfactory.

The committee was appointed to continue its work for another year, and was requested to issue another circular asking for the further co-operation of the profession, this circular to be sent out as soon as possible, in order that physicians may record their cases as they occur through the coming year.

FATAL CASES OBSERVED DURING THE EMPLOYMENT OF DIPHTHERIA ANTITOXIN

Editorial, American Medico-Surgical Bulletin.

Gottstein, in the May number of the *Therapeutische Monatshefte*, has collected a number of instances from the literature of diphtheria antitoxin, in which the authors themselves raised the question whether the deaths they reported could be attributed to the serum. While in some diphtheria was present, in others diphtheria was suspected or the patient was healthy and the antitoxin was used as an immunizing agent. In the former class Gottstein believes that it is a question open for discussion, whether the serum or the dominant disease can be made responsible for the death; in the latter, the assertion that a latent diphtheria, or other severe affection, is difficult to overcome.

The Imperial German Board of Health Report for the first quarter of 1895 comprises 2228 cases treated with antitoxin, of which 368, 17.3 per cent, died. In connection with these the following were observed: Exanthema, 207 times; scarlatinoid exanthema, as well as erythema multiforma, 103; urticaria, like eruptions, 75; pemphigus, 2; joint and limb pains, 24; albuminuria, 22; paralysis, 16; effects upon the heart's action (syncope),

3; high fever for a number of days, 6. Deducting the albuminuria, paralysis and heart weakness, confining the figures to pure serum sequelae complications, the number is 420 cases, 23.3 per cent.

Regarding the fatal cases following the use of antitoxin, the following may be mentioned:

1. Reported by O. Vierordt (*Deutsch. Med. Woch.*, 1895, No. 11). Girl aet. 2½ years, affected with moderately severe pharyngeal diphtheria; 4200 immunizing units were injected; death followed from heart failure. The author and Prof. Arnold do not consider the death due to antitoxin.

2. Lennox-Browne states (*British Med. Jour.*, Dec. 22, 1894) that of 5 cases, 2 died from complete anuria 35 to 45 hours after injection.

3. Engel-Bey asserts (*Berlin Klin. Woch.*, 1895, No. 37-41) that often, in connection with the injections, the existing weakness was intensified, the children being thrown into a state of prostration from which they did not rally.

4. Reported by E. Rosenthal (*Med. News*, May 25, 1895). A child, 1 year and 7 months of age, suffering from laryngeal diphtheria, was intubated and given an injection of 1000 units on the fourth day of the disease. Six hours later the temperature was 104.3° F.; pulse, 160; respirations, 60; and death resulted 49 hours after intubation. Rosenthal concludes: "Unquestionably the serum was not the cause of this fatal case."

5. Pistis reports (*Centbl. f. Bakt* 17, p. 773) a girl, aet. 4, who reacted to an initial injection with increase of the fever and excretion of albumin, and died within a few hours.

6. Saltmann (*Deutsch Med. Woch.*, 1895, No. 4) says that the favorable action upon the pulse could be detected in but 5 cases. In almost all the cases the pulse remained rapid, often small and irregular. In four cases unexpected fatal collapse. Such collapse has also been reported by Timmer (*Deutsch Med. Woch.*, 1895, No. 37), who states that he had observed it in 5 cases, all of which recovered.

7. Hagenbach reports (*Corrsbl. Schweiz. Aertz.*, 1895, No. 1) a case in which petechiae in the skin were observed three days after the injection. The very extensive membranes were exfoliated within twenty-four hours, leaving freely bleeding ulcer surfaces and coincidentally there was a complete decline of fever. Seven days later profuse vomiting, which could not be checked, occurred, and three days after death resulted from collapse. The cutaneous petechiae, the hemorrhages in the mucous membrane

of the intestines, and the condition of the heart and kidneys, observed at the autopsy, the author believed due to the serum.

Gastro-enteritis hemorrhagica is not an uncommon post-mortem finding in these cases. Baginsky observed it in 11 out of 67 autopsies. Since sepsis induces fibrin-ferment intoxication, gastro-enteritis hemorrhagica may also occur in cases of septic diphtheria independently of serum. Such cases are, therefore, not dependent upon the serum, though this coincidence in diphtheria is otherwise so infrequent that it is given no special consideration in the great hand-books and monographs. Accordingly, the frequency of this observation during the serum period lends Hagenbach's assumption no small amount of support.

8. Guinon and Ronfilange (*Sem. Med.*, 1895, p. 300). The serum was used in the case of a girl 3 years old on the third day of the disease. After the first injection of 15 c. c. of Roux's antitoxin, the membrane formation ceased, glandular swelling increased, an exanthema appeared and mild albuminuria was observed, which was increased and accompanied by decrease of urine and depression, when a second injection of 5 c. c. was given. A third injection augmented the symptoms, there being complete anuria, fetid diarrhoea, tympanites and vomiting. On the third day a fourth injection was given, followed by complete anuria, coma and convulsion and by death on the following night.

Thibierge and Sevestre report similar cases, though the latter does not consider the results as due to the serum, but classed them as secondary streptococcic invasions.

In regard to the fatal cases attending the employment of antitoxin in non-diphtheritic cases the following may be cited:

1. Alfoeldy (*Pesth Med. Press.*, 1895, No. 10) reports a child, aet. 3, immunized by an injection of 100 antitoxin units, followed on the second day by pain in the lumbar region, temperature 104° F., intense albuminuria, petechiae and death in four days. Baginsky considers this case one of hemorrhagic scarlatina, while Bokai suggests that it was diphtheria fulminans.

2. Moizard (*Sem. Med.*, 1895, p. 309) and Bonchard observed the case of a girl aged 6 years, who suffered from non-diphtheritic angina, and was given an injection of 10 c. c. of Roux's serum. Exfoliation of the membranes followed upon the next day. On the sixth day a scarlatinoid eruption appeared at the point of injection, accompanied by increased temperature and death. While Moizard considers the death due to the serum, Chantemesse and Sevestre, however, ascribe secondary streptococcic invasion as a cause.

3. Johannessen (Deutsch Med. Woch., 1895, No. 13) immunized eight patients in one ward with one-quarter of a phial of Behring's serum (600). Reaction followed in one case only, being exhibited intestin inflammation which greatly increased in severity. The boy died of collapse on the tenth day, and the autopsy showed follicular enteritis and streptococci in the heart's blood, wherefore it may be concluded that the cause of death was streptococcic infection.

4. S. S. Halderman (Jour. Am. Med. Assn., 1896, June 13, p. 1168) reports a "death occurring in about four minutes after injection under the scapula in a boy, five years old, a prophylactic dose of Behring's antitoxin, No. 0.

From the foregoing it is to be observed that death may result from injections of serum in healthy as well as in sick children. Sleich and Hansemann emphatically stated, in 1894, that such accidents were possible, and the latter called attention to the danger of large doses. The phenomena which are observed in connection with the administration indicate that we have to do with a dangerous remedy. The editorial concludes with the statement that the immunizing action of antitoxin has been definitely settled in the negative by sufficiently numerous failures to protect.

THE THERAPEUTIC VALUE OF DIPHTHERIA ANTITOXIN.

By Wm. Vissman, B. A., M. D., New York.

From the American Medico-Surgical Bulletin.

After theorizing as to the probability that diphtheria antitoxin will have its rise and fall, like tuberculin, the writer states that it is not fair to compare diphtheria with small-pox; for while the latter is a disease which gives almost permanent immunity to subsequent attacks, the former is inclined to predispose to another attack. While vaccination has reduced the number of cases of variola and also decreased the number of deaths, no such claim can be made for antitoxin.

The percentage of mortality of diphtheria in New York, Brooklyn and Boston, is very much reduced, due probably to the increased number of cases reported. The following exhibits the average number of deaths per year from 1880-1895, compared with the report of 1895:

	New York.	Brooklyn.	Boston.
1880-1895.....	1631	824½	452½
1895.....	1684	1139	588

The percentage of the inhabitants dying from diphtheria is as follows:

	New York.	Brooklyn.	Boston.
1880-1895 } .....	.1095	.1024½	.1084½
Average }			
1895.....	.1173	.1035	.0873

In New York the percentage in previous years was far lower; thus in 1892 it was 0.0785; 1891, 0.081; 1890, 0.0774; 1884, 0.0801; 1883, 0.0772.

The method of diagnosis has much to do with the low percentage of mortality during 1895, but the number of deaths seems not to have been materially affected, and the writer seems to entertain the idea that many non-diphtheritic cases are pronounced diphtheria by clinicians and microscopists. Since the physicians now so largely rely upon the bacteriological experts of the Board of Health for a diagnosis, and since the physicians still report the deaths, the authorities reporting the cases have changed, while the authorities reporting the deaths are the same as before. Hence, the statistics showing the number of deaths are of most value in judging of the efficacy of antitoxin.

THE VALUE OF ANTITOXIN.

By Jas. L. Kortright, M. D., New York.

From the American Medico-Surgical Bulletin.

The writer's experience corresponds to that of Berg and Peabody, who state (Med. Record XLIII, p. 913): "In private practice, he (Berg) had found antitoxin the most marvelous remedy for diphtheria which he had ever used. Dr. Peabody considers that any one who will watch the influence of antitoxin will be impressed with its remedial power. The value of the remedy is also attested by the moderation of the severity of the disease, the shortened convalescence and the diminished frequency of complications.

With antitoxin, the prognosis depends largely upon the amount of swelling in the neck. If it is circumscribed, the prognosis, while diffuse swelling and involvement of the subcutaneous connective tissue result less favorably.

While the risk of using antitoxin is slight, it is justifiable to administer it to diphtheritic patients; however the wisdom of giving antitoxin as an immunizing agent is questionable.

**CLINICAL OBSERVATIONS UPON THE USE OF ANTITOXIN IN DIPHTHERIA,
AND A REPORT OF A PERSONAL INVESTIGATION OF THIS
TREATMENT IN THE PRINCIPAL FEVER HOS-
PITALS OF EUROPE DURING THE
SUMMER OF 1895.**

By Joseph E. Winters, M. D., New York.

From the Medical Record, June 20, 1896.

The writer introduces his paper by stating that Behring's antitoxin was given to the world as a specific against the toxins of the diphtheria bacillus, but it has no action on the bacillus. Diphtheria in man is rarely a pure infection of the Loeffler bacillus, and therefore the application of the antitoxin is limited. If it is a specific antidote, death from cardiac depression and paralysis, albuminuria and post-diphtheritic paralysis should be prevented. Armand Ruffer shows the great difficulty of immunizing animals against diphtheria if some time is permitted to elapse after infection, and if the antitoxin is used at a place distant from the point of infection. Hence, the use of antitoxin in man must be still further limited.

To be consistent, the decrease in mortality from diphtheria should be practically the same in all countries where antitoxin is used, otherwise the variations may be said to be due to the epidemic character of the disease.

The following divergences in the deaths from diphtheria are recorded:

New York, 1884, 1090; 1887, 2167; 1890, 1262; 1894, 2359; Boston, 1891, 232; 1894, 817; Philadelphia, 1888, 350; 1889, 375; 1892, 1425; London, 1891, 1361; 1893, 3265; Berlin, 1866 (croup and diphtheria) 813; 1867, 907; 1868, 2154; 1877 (with a half million increase in population), 1091.

Similar variations are shown by hospital reports for different years. Thus in the Children's Hospital at Basel, in 1876, it was 34.1 per cent and in 1886, 6.2 per cent. In the Crown Prince Rudolph Hospital, in 1887, it was 27.1 per cent. and in 1888, 62.8 per cent.

Where there is such a wide range in the results according to different observers, the natural inference is that there is a difference in the character of the cases. The decrease in the percentage of mortality reported is greatly due to the larger number of cases reported; for instance, the following shows the results in the Boston City Hospital:

	Cases.	Deaths.	Per cent.
1893.....	419	203	48.44
1894.....	598	266	44.48
1895.....	1566	207	13.21

From the foregoing it will be seen that a statement as to the percentage of the mortality is no criterion unless it is accompanied by an account of the number of patients treated.

The necessity of taking into consideration the character of the prevailing epidemic is shown by the following: Escherich treated

	Cases.	Deaths.	Per cent.
By injection of serum.....	51	5	9.8
By non-injection.....	36	3	8.3

Koht's mortality in tracheotomy cases with serum is 29.41 per cent; without serum, 25 per cent. For cases not operated upon with serum, 7.6 per cent; without serum, 6.9 per cent. At the beginning of the antitoxin treatment, Behring announced that all cases treated upon the first day could be saved, nearly all, when the serum is used on the second day, and the larger part of those injected upon the third day, while the percentage of mortality could be reduced to one-tenth. The following exhibits the results of treatment at the Willard Parker Hospital, during the first nine months of 1895:

	Cases.	Mortality.
First day.....	108	10.09
Second day.....	130	25.19
Third day.....	116	34.19

The writer then recounts the history of forty-one fatal cases where antitoxin was used. In these cases treatment was begun on the first or second day of the disease in the majority of the patients; and while they received full doses of the so-called specific, yet in not a single instance do the histories indicate that any manifestation of the disease was modified by the remedy, and the clinical records are totally against the use of antitoxin. Careful study will show that many of the clinical features recorded are due to the treatment and not to the disease.

INJURIOUS EFFECTS OF ANTITOXIN.—In certain individuals the gravest symptoms or death may result from a relatively small dose of antitoxin, the predominant symptoms being referable to the nervous system, kidneys, heart, pulmonary organs and the body temperature. Mention is made of the case of Prof. Langerhans son, Dr. Clayland's patient, and the sleeping child reported by Halderman, which died five minutes after a prophylactic injection of serum. Dr. C. C. Gratiot reports the case of a woman apparently in good health who was seized with alarming symptoms after an injection, and Johannessen narrates the case of a boy who died after immunization. Alfoldi

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The writer then recounts the history of forty-one fatal cases where antitoxin was used. In these cases treatment was begun on the first or second day of the disease in the majority of the patients; and while they received full doses of the so-called specific, yet in not a single instance do the histories indicate that any manifestation of the disease was modified by the remedy, and the clinical records are totally against the use of antitoxin. Careful study will show that many of the clinical features recorded are due to the treatment and not to the disease.

INJURIOUS EFFECTS OF ANTITOXIN.—In certain individuals the gravest symptoms or death may result from a relatively small dose of antitoxin, the predominant symptoms being referable to the nervous system, kidneys, heart, pulmonary organs and the body temperature. Mention is made of the case of Prof. Langerhans son, Dr. Clayland's patient, and the sleeping child reported by Halderman, which died five minutes after a prophylactic injection of serum. Dr. C. C. Gratiot reports the case of a woman apparently in good health who was seized with alarming symptoms after an injection, and Johannessen narrates the case of a boy who died after immunization. Alfoldi

and Moizard and Bonchard report fatal cases, while Dr. LeGendre signifies his conformity to the view of Moizard as to the inadvisability of resorting to preventive injections of serum. Guinon and Ronfilange report a case where, after coma and convulsions, death ensued, and Thierberge instances the severe symptoms from which his own daughter suffered after a serum injection. Mya (Florence) states that in five patients with simple follicular tonsillitis, in whom the renal functions were absolutely normal before treatment, who on the sixth day of the disease suddenly presented manifest symptoms of intoxication, such as anuria, etc. Autopsy showed fatty degeneration of the viscera, with grave pathological changes in the lymphatic tissue. Similar cases are reported by Galler and Springorum. Variot, Engel Bey, Lennox-Browne, Soltmann, Korte, Trimmer, Hagenbach, Korach, Hutinel, Sevester, Grandinger, Withington, Scales, Vierordt, Fleming and Brannan, have all given evidence of alarming or fatal results from serum administration.

It is generally claimed, in defense, that the ill effects in the form of high fever and suppurations are due to streptococcus infection; but in opposition to this view is the fact that they supervene after the disappearance of all throat lesions. It is a weak admission to claim that the bad effects are due to the amount of serum injected.

ANTITOXIN IN PRIVATE PRACTICE.—Reports from private practice indicate an unfavorable expression against the serum.

NEW YORK FOUNDLING ASYLUM.—J. Lewis Smith reports 31 patients treated with antitoxin, with a mortality of 54.8 per cent (17).

PHILADELPHIA MUNICIPAL HOSPITAL.—Out of 706 cases of diphtheria in 1895, 302 received serum treatment, with a mortality of 28.1 per cent, and 404 without serum treatment, resulting in a mortality of 25.9 per cent. The same local antiseptic measures were used in both sets of cases.

BLEGDAM HOSPITAL, COPENHAGEN.—Sorensen reports 51 cases of severe diphtheria with serum, and 46 cases without serum, during the same period; mortality, 33 per cent in both series. The total number of patients treated during this period was 385, with a mortality of 16 per cent, showing that the epidemic was a mild one. The serum was used earlier in the fatal cases than in the cases which recovered; that is, the day of the first injection was, on the average, earlier in the fatal than in the successful cases. Those in charge failed to see any favorable action of the serum. The mortality of all serum

cases of croup with diphtheria was 28 per cent; of the operated cases, 40 per cent; while in the uninjected cases the total mortality was 25 per cent, and for the operated cases 38 per cent.

REPORT OF THE MEDICAL SUPERINTENDENTS OF THE METROPOLITAN ASYLUMS BOARD (LONDON) 1895.—

S. W. Hospital.			N. W. Hospital.			
	Cases.	Deaths.	Per cent.	Cases.	Deaths.	Per cent.
1892.....	463	93	22.5	682	138	21.8
1893.....	585	159	27.1	12.49	332	26.5
1894.....	546	156	28.5	1147	309	26.9
1895 (antitoxin).	316	94	29.7	363	117	32.2
TOTALS.						
	Cases.	Deaths.	Per cent.			
1892, '93, '94.....	4672	1187	25.4			
1895 Antitoxin.....	2182	615	28.1			

In the report, there is expressed a lack of uniformity in the results which is opposed to the view that the antitoxin has any specificity. Great variance is found in the mortality in the cases where the injection was used on the second day, in one hospital the mortality being 28.9 per cent., in another, 3.8 per cent. Laryngeal cases furnish interesting matter in this report; 225 tracheotomy cases were treated with antitoxin, 113 deaths or 50.2 per cent; 30 tracheotomy cases were treated without antitoxin, with 12 deaths, or 40 per cent. Compare the following from the northwestern hospital:

In 1895, 28 tracheotomy cases treated with antitoxin, 18 deaths, 64.2 per cent. In 1892, 58 cases, 33 deaths, 56.8 per cent. In 1893, 78 cases, 44 deaths, 56.4 per cent. In 1894, 79 cases, 47 deaths, 59.4 per cent.

Antitoxin in Laryngeal Diphtheria.—About the only claim made for antitoxin at the present time by its advocates is that it has a favorable influence upon laryngeal diphtheria. But Roux does not believe the serum is of any use in pseudo-membranous bronchitis. Why should it influence the disease on one mucous membrane and not upon another? The following statistics show the results in laryngeal diphtheria:

Soltmann: In 89 treated with serum, extension downward occurred in 13.

Willard Parker Hospital: Mortality for first nine months in intubation cases, 68 per cent, in the last three months 76.9 per cent; first quarter 1896, 31 cases, 21 deaths, 67.7 per cent.

Philadelphia Municipal Hospital: 71 intubation cases without serum, 40 deaths, 56.3 per cent.

W. W. Seymour: Eight recoveries out of ten intubations, of which seven were uninjected and three (one fatal) were treated with serum. Mortality, serum cases 33.3 per cent, other cases 14.2 per cent.

Winderhoefer: Mortality of intubation cases 43 per cent. (before serum treatment).

Von Ranke: 326 intubations, 57.4 per cent. mortality (before serum treatment).

Meisenbach: In tracheotomy cases before serum treatment, 57 per cent mortality.

In Strassburg: 397 tracheotomies (1891-94), mortality 44.3 per cent.

In Geneva: Mortality of tracheotomy cases (1872-88), 49 per cent.

In Basel: 333 tracheotomy cases, 197 deaths, 59.2 per cent.

In the University College Hospital, London: In 1894 mortality of tracheotomy cases, 47 per cent.

Sonneburg: 13 tracheotomy cases with serum, mortality 37.8 per cent; 35 without serum, 37.1 per cent.

Kohts: Mortality in tracheotomy cases with serum, 29.1 per cent; without serum, 25 per cent.

Great variance in the results is found in Soltmann's report of intubations with serum. Thus the mortality in June was 16.7 per cent; in May, 88.9 per cent; in February, 22.2 per cent; in March, 28.6 per cent; in April, 42.9 per cent. A similar condition is found in his report upon diphtheria of the nose and throat. The mortality in February was 5 per cent; in March, 60 per cent; April, 7 per cent; May, 21.4 per cent; June, 14.3 per cent; July, 25 per cent. The variations argue against the specific influence of the remedy.

Why Antitoxin is Popular.—The fame of antitoxin is largely due to the influence of two hospitals, the Empress Frederika Hospital (Baginsky), and the Hospital for Sick Children in Paris (Roux and Martin). Baginsky reports 525 cases treated with serum, with 83 deaths (15.6 per cent); 875 cases were admitted into the hospital during the fourteen and a half months of serum treatment, while during the years 1890-93 there were 1063; during the former period diphtheria was not epidemic. In the Empress Frederika Hospital the greatest care is taken in the examination of children. Every child presenting any throat lesion is at once isolated and injected with antitoxin, and, if Loeffler's bacillus is found, is placed in the diphtheria pavilion and is subjected to further treatment. This accounts for the great increase in cases and also for the low mortality,

making such a strong impression on Virchow. The average number of cases treated at the Trousseau Hospital before the advent of antitoxin was 800 a year (the highest, 900); while during the first year of the serum treatment, they were between 1400 and 1500. The Medical Week states the fact that there was during Dec., 1895, a sudden increase in the mortality to 23 per cent, identical with the average of five years; and the Medical Record suggests that we may have been passing through a period of mild diphtheria. Variot states that bacteriology has included a great many cases not formerly considered diphtheria. Von Ranke had 162 cases in six months, when previously he averaged 142 a year. Landau treated 448 by serum in six months, whereas, in the same hospital, during the past 15 years, the average was 132½. Rauchfuss treated 101 cases with serum in four months, while during the previous 25 years they average 142 cases. Vierordt treated 70 cases with serum in four months, against 56 during the previous ten months. Germonig, in a little over five months, applied antitoxin to 362 cases in the Civil Hospital (Trieste). There were in this hospital in 1892, 78 cases; in 1893, 110; in the first eight months of 1894, 149 cases. The mortality of 75 cases at the University College Hospital, London, was 28 per cent; at the American Urban Hospital, out of 245 patients, 28 per cent. Kossel reports 233 cases; 54 deaths, mortality, 23.1 per cent. Soltman—181 cases, 44 deaths, 24.3 per cent. Heubner's mortality, by way of contrast, was 22.5 per cent. during the past 15 years. Report after report might be quoted showing a range of mortality under the serum treatment of 23 to 45 per cent, in denial of Behring's promise to reduce the mortality to one-tenth its former rate. Numerous illustrations of complications which were increased by the serum are given, such as cardiac and other paralyses, albuminuria, articular manifestations and convulsions. It is certainly impossible to get any therapeutic results from rectal injections of antitoxin, and yet the statement has been made that in twenty patients, the results were precisely the same as when given hypodermatically. From the inauguration of the treatment until the present time not one fact has been presented which shows that serum treatment has any exact scientific value or scientific basis.

Kohts (Strassburg) sums up his conclusions on the serum treatment at the Congress für Innere Medizin, München, April, 1895, as follows:

"The mortality of patients treated with Behring's heilserum is for tracheotomy cases 29.4 per cent.; for those not operated on, 7.6 per cent.

"This result is less favorable than in the year 1891, when the mortality of tracheotomy cases was 25 per cent without antitoxin; for those not operated on, 6.9 per cent.

"Secondary affections, as disease of the kidneys, affections of the heart, and paralysis, are not prevented by the serum. The result by injection of heilserum during the first two days of the disease does not differ from the results obtained without serum when the patients come under treatment within the first two days of disease. When there was coincidence of severe case of diphtheria with severe chronic and acute disease, pneumonia haemorrhagica, thrombosis of the heart, and subpleural hemorrhages were observed."

After a thorough study in various hospitals in Berlin of the use of diphtheria serum, Passed Assistant Surgeon F. J. B. Cordeiro, U. S. Navy, in a report to the surgeon-general of the navy, concludes that, so far, proof is lacking of the value of the antitoxin in the treatment of diphtheria:

"1st. A large number of children treated with both small and large immunizing doses have, within a few weeks, acquired diphtheria, and some of them have died of it. We do not possess a single scientific proof that a case of diphtheria was ever prevented by the immunizing process.

"2d. Children, who during the first sickness have been treated with large doses of serum, have a short time after acquired diphtheria anew. They were not rendered immune either by their sickness or by the largest doses of the antitoxin.

"3d. In a large number of cases, children have been treated on the first or second day of their illness with the fullest dose of the antitoxin, and have died.

"4th. It is certain that a large part of those who have died, notwithstanding the serum treatment, did not die from the effects of a mixed infection, but directly from the specific effects of Loeffler's bacillus.

"5th. Heart and other post-diphtherial paralyses are also seen in early and fully treated cases, and they occur as often as they did before the serum treatment.

"6th. Of a fever fall by crisis in the first twenty-four hours, and of a pronounced antipyretic effect of the serum, most observers have seen nothing or next to nothing.

"7th. The separation of the membranes follows in the cases that run favorably in the customary manner; but often there is an extension of the local process and a renewal of the already separated membranes during and after the serum treatment.

"8th. The burden of proof lies with Behring and his co-workers. The world eagerly and only too willingly received this proof. We know that the former extravagant promises are out of the question; but we should be grateful to have it demonstrated that the serum can reduce the mortality by even one per cent. As yet we have not the slightest basis on which to found an expectation that fewer children will die in the future of this disease on account of the serum treatment."

One of the strongest arguments against the antitoxin is the attitude of those who are living in hospitals and who formerly were earnest advocates of the treatment, and who, after experience, have from conviction become opposed to it. Among those specified were Drs. Welch, Steinsieck, Warmuth, Tyler, Bemis, Hardin, Levy, Variot.

The writer closes his paper with the following words:

"With reference to a prejudice, it is monstrous to speak of it—a prejudice against anything which could do any good in such a disease as diphtheria! A man who would have a prejudice against a specific for diphtheria should not be allowed to practice medicine. If there is a specific for diphtheria, I want it; no member of this academy, no member of the profession in any portion of the world, needs it more than I do; and every man who knows me, knows that it would not be possible for me to cast a word of doubt upon any remedy which could be of the least possible use in the treatment of diphtheria. I could not possibly have brought myself to the position in which I find myself to-night, had it not been for my strong conviction regarding the injurious effects of antitoxin. Could I have found that antitoxin did not do any harm, even though it was valueless in the treatment of diphtheria—even though it did not reduce the mortality—I would never have said anything against it. It is because I believe it is dangerous that my convictions compel me to speak. The time will come, gentlemen, when every member of the academy will feel with reference to it as I do to-night, and you will come to it from conviction, as various members have already."

**HOW THE FACTS ABOUT ANTITOXIN TREATMENT OF DIPHTHERIA
SHOULD BE ESTIMATED.**

By W. H. Thomson, M. D., LL. D.

From the Medical Record, June 20, 1896.

In estimating the value of the treatment of acute infectious diseases, one must take into account the fact that some cases will recover without treatment, the difficulties of diagnosis, the severity of the infection, the possibility of a change in the virulence of the pathogenic germs themselves, the occurrence of poly-microbial infection and the time of administration of the remedy. There are, therefore, so many circumstances to be considered that it seems a hopeless undertaking to settle it at all.

In the first place, decisions on therapeutic questions must rest upon comparative success, and that alone; and unless this postulate be granted, no decision can be reached. The failures of a remedy are not proofs of its valuelessness. Quinine, vaccination, and mercury often fail to produce their expected results.

Diphtheria is a wide-spread disease characterized by a pretty uniform range of mortality in all civilized countries, and therefore, the verdict regarding any proposed remedy must depend upon the competency and number of reporters, and such difference in locality and nationality that all personal or local influence can be safely left out of account.

The antitoxin treatment has been on trial for about a year and a half, and reports have been made from physicians and public institutions in Austria, Holland, Belgium, Denmark, Russia, Japan, France, Italy, British Empire, Australia and all America. The following shows the results in the different countries:

NAME.	Without Antitoxin and With and Without Antitoxin.		With Antitoxin.	
	Cases.	Per cent. Mort'y.	Cases.	Per cent. Mort'y.
AUSTRIA.				
St. Anne's H., Vienna.....	760	50.68	159	25.15
do to end of June, 1895 ..	...	...	560	19.1
Joseph's H., Vienna.....	299	52.6	42	26
Leopoldstadt H., Vienna.....	...	34.9	...	26.9
Crown Prince Rudolph H., Vienna	...	36.5	...	20.
Kaiser Franz Joseph H., Prague..	...	28.	...	13.2
University Clinic, Prague..	...	36.2	...	20.8
Anna H., Prague.....	...	13.7	...	9.9
Child's H., Buda-pest.....	...	41.1	...	17.5

NAME.	Without Anti- toxin and With and Without Antitoxin.		With Antitoxin.	
	Cases.	Per cent. Mort'y.	Cases.	Per cent. Mort'y.
Unterholtzen.....	...	66.7	37	21.6
Hein.....	...	52.5	27	22.
Monti.....	25	4.
Ganghofner.....	144	43.	110	12.7
Von Engel.....	62	50.	39	25.5
Jakenbowski.....	...	50.	100	30.
Germonig.....	65	50.	224	20.3
Bokai.....	...	60.2	120	25 8
GERMANY.				
Kaiser and Kaiserin H., Berlin...	217	47.4	384	16.6
Child's Hospital, Dresden.....	...	45.6	...	28.8
New Hospital, Leipzig.....	...	32.	...	14.5
Olga H., Stuttgart.....	...	34.8	...	12.
Child's Hospital, Lübeck.....	...	56.	3	0.
Siegel.....	...	50.3	100	12.
Rumpf.....	...	25	22	8.
Erlich, Kossel, Wassermann.....	...	54.8	233	23.
Baginsky.....	...	48.	525	15.6
Von Mering.....	...	30.	74	5
Körte.....	...	57.4	121	33.3
Schroeder.....	...	33.	63	12.7
Moeler.....	...	43.8	76	35.
Von Ranke.....	...	50.	225	19.1
Hilbert.....	11	0.
Vierordt.....	...	54.	63	25.
Börger.....	...	25.	190	8.
Tiemmer.....	...	40.	147	8.8
Sonnenburg.....	...	27.6	107	20.4
Soltman.....	...	80.	181	24.2
SWITZERLAND.				
Child's Hospital, Hettingen, Zurich.	...	19.6	...	3.4
Sietz.....	293	30.	27	3.8
Von Musel.....	58	3.4
HOLLAND.				
Van Noorden.....	...	30.	81	23.
BELGIUM.				
Choran.....	13	30.8
SWEDEN.				
Christiania Hospital.....	576	19.2	212	9.9
DENMARK.				
Blegdam Hospital.....	385	16.

NAME.	Without Anti-toxin and With and Without Antitoxin.		With Antitoxin.	
	Cases.	Per cent. Mort'y.	Cases.	Percent. Mort'y.
RUSSIA.				
Rauchfuss	52.	34	21.
Geloczy	55	27.3
Stinzing	25.	59	20.3
JAPAN.				
Kitasato	56.5	353	8.78
AUSTRALIA.				
Sidney Children's Hospital	100	51.	100	23.
FRANCE.				
Roux and Martin	50.	300	26.
Le Gendrie, Hospital Trousseau	55.	17	12.5
Mayzard and Perregaux Hospital	55.	231	14.7
Sevester Hospital	55.	150	10.
D'Espine	60	10.
Le Breton and Maydeleine H	55	258	12.
Dreyfus, Hospital Lyons	51	9.2
ITALY.				
Tantucci and Mucci	57.	13	23.
Pietororo	50.	20	20.
Giané and Matteucci	46	28.2
ENGLAND.				
Goodall, Washbourne and Card	30.8	177	20.8
Winkfield	36.	22	18.2
Matthews	30.8	61	16.3
Gayton	43	4.6
Bruce	68	14.7
Hall	11	27.
Fraser	95	23.
Johnston	105	14.3
Raew	47.	16	12.
Ruffer	274	13.5
Sidney Martin	37.8	75	28.
AMERICA.				
Withington	30.	50	16.
Fischer	225	15.5
Mason	48.	306	26.4
McCollom	844	11.3
Welsh	25.9	302	28.1

The last reporter presents the only unfavorable statement except Springoram, who reports 206 cases with 78 deaths, 37.9 per cent, against a mortality of 25 per cent without antitoxin.

Summing up the list of reports, in 85 hospitals in every part of the world, the antitoxin was administered in 9,893 cases with 1820 deaths or 18.3 per cent. In 53 hospitals, 7,277 cases were treated with serum, resulting in a mortality of 20 per cent against 44.3 per cent previously, whence the conclusion that antitoxin has reduced the mortality of diphtheria 50 per cent. Hospital statistics afford a more certain gauge of the previous mortality from diphtheria, and cases which are found in hospitals are much less likely to be brought in early for treatment, the mild cases are not apt to be brought in at all, and the proportion of laryngeal cases is larger the world over in hospitals than in private cases. It is for these reasons that hospital reports are specially considered.

The mortality of 18.3 per cent shows that antitoxin is no specific in the sense in which Dr. Winters uses the term. Results vary because the antitoxin in itself is not a definite compound, and because the disease itself is not unvarying. It is not a question of specificity, but of improvement in results.

Reports of results in private practice exhibit abundant evidence. Thus from 33 reports of private practice, collated by Dr. Guerard in 3760 cases treated with antitoxin, there were 296 deaths, 7.8 per cent. Adding this to the hospital cases, the total is 13,653 with a mortality of 15.5 per cent. The severest test to which the serum treatment is put is laryngeal diphtheria, and every civilized country shows a most marked improvement in this class of cases. It is ludicrous to ascribe these good results to self-deception which if true must claim the best diagnosticians of the profession as its victims. It seems more probable that a really great advance in the practice of medicine now marks the close of the nineteenth century in the introduction of serum treatment of diphtheria, and that it is a promise of greater triumphs still in this progressive branch of therapeutics.*

A CRITICAL ANALYSIS OF DR. WINTERS' CLINICAL OBSERVATIONS ON THE ANTITOXIN TREATMENT OF DIPHTHERIA.

By John Winters Brannan, M. D., New York.

From the New York Medical Record, June 20, 1896.

The writer stated that hospital testimony as to the value of antitoxin was of less service than that of private practice, as the hospital conditions acted as limitations to the efficiency of

such a remedy. Attention was called to Dr. Winters' sentiments so often expressed with regard to the administration of the Willard Parker Hospital, which, if true, must show that New York has maintained a hospital in which children are subjected to treatment which is not only useless but which has in many instances led directly to the death of those children.

In presenting the answer to Dr. Winters, the writer expressly states that he attacks his position, not the man.

Dr. Winters entered upon his observations with considerable bias against the antitoxin; in fact, after barely three months observation, he decided for all time that antitoxin was valueless and even produced great harm, and since that time his convictions have become more fixed.

THE CHARACTER OF DR. WINTERS' EVIDENCE IN THE WILLARD PARKER HOSPITAL.—Dr. Winters narrates twenty-five or thirty cases with fatal termination following the administration of antitoxin in the Willard Parker Hospital on the first, second and third day of the disease, giving very meager details of the cases. The records of the hospital show in the first four months of 1895, antitoxin was given on the first, second or third day in 19 fatal cases. All cases in which treatment was begun on the first day recovered. Of these 19, 12 were under 2, 2 between 2 and 3 years, 1 was 4 years, two 5, one 7 and one 45 years old; 12 were laryngeal, requiring intubation or tracheotomy, of which 7 had pneumonia in addition. Pneumonia was present in five of the other cases. The adult patient had impending delirium tremens. It therefore seems improper to call these mild cases. The prognosis on entrance stood, good 6, doubtful 5, unfavorable 8.

The fatal cases during the early months of 1896, admitted on the first, second or third day of the disease, numbered 33; 7 being under one year, 13 between one and two, 4 just two years old, 5 between two and three, and 4 over three. Twenty-two had laryngeal stenosis, requiring operation in 19; 15 had pneumonia; 2 suffered from sepsis; 1 was intoxicated on admission. Prognosis on entrance was good in 2, doubtful in 20, and unfavorable in 11.

Dr. Winters insists that the cases should be weighed, not counted. They should be both weighed and counted. He has not mentioned the fact that for every 8 of the first-day patients who died, 92 recovered; for every 24 of the second-day patients who died, 76 recovered; and that for every 27 of the third-day patients who died, 73 recovered.

Dr. Winters states that to overcome the depressing effects of antitoxin upon the heart, alcoholic stimulation is more common. The practice is directly opposite. There is less need of irrigation of the nose and throat, less use for iron and other tonics, and a smaller consumption of alcoholic stimulants. In order to show the correctness of the position, it has been learned by recourse to the Health Department records that the per capita daily consumption of alcoholic stimulants at the hospital in 1894 was .65 ounce, and in 1895 and 1896 (to May 1) .43 ounce.

He also states that there prevailed during the past year a new type of uncontrollable diarrhoea, which is, however, at variance with observations of the rest of the attending staff. But one case of severe diarrhoea occurred during the past winter—a case of colitis—which lasted for some weeks and ended in recovery. Similarly, the rest of the staff failed to notice that the broncho-pneumonia and suppression of urine were of an unusual type. Albuminuria was somewhat more frequently observed, perhaps, by reason of more careful urinary examinations, but it was seldom accompanied by serious involvement of the kidneys. Cardiac weakness was no more common than in previous years, and post diphtheritic paralysis, except that of the palatal muscles, was noteworthy by its absence. The figures 72 per cent, the mortality of intubated cases (with antitoxin), must not be compared to the results from laryngeal cases without antitoxin as claimed by Dr. Winters, but to a mortality of 85 per cent, which was the record for similar cases without antitoxin. The writer controverts the responsibility of antitoxin for the death of Elsie Biershauk, by the evidence of the house physician, to the effect that antitoxin had not been administered for immunization as stated by Dr. Winters. While Dr. Winters has given numerous instances of death from antitoxin, he has singularly failed to give the results of autopsies, yet a large number of microscopical sections were made. The writer's own observations demonstrated no lesions which differed from those ordinarily found in diphtheria autopsies. Kolisko, who has made 1,000 autopsies on patients dying from diphtheria, after making 75 post mortems on patients who had been injected with antitoxin, came to the following conclusions:

1. That serum influences the diphtheritic process most favorably.
2. That the false membranes are more easily separated and converted into a soft pultaceous mass.
3. That the anatomical changes are the same as under other forms of treatment; that antitoxin has no effect on the kidneys.

4. That the diphtheritic process may remain localized at some hidden point for some time before it breaks out; such cases may explain death where the injection is supposed to be given the first day of the disease.

Dr. Winters' statements regarding the views of a number of physicians who were accustomed to use antitoxin has been denied by many who were quoted.

EUROPEAN EVIDENCE OF DR. WINTERS.—The three European opponents of antitoxin are Hanseemann, Kassowitz and Lennox-Browne. The first of these subsided after his first report. Kassowitz had a personal experience of only eight cases, all of which recovered, and since his attack he has not ventured a second paper. Lennox-Browne may be left to the English, who, though slow, usually come to sound conclusions in the end.

Dr. Winters quotes Dr. Catherton and Dr. Grant, neither of whom appear to have had any experience. Such evidence can hardly outweigh that of Von Ranke, Baginsky, Heubner, Widerhofer, Roux and Bokai, who after ten or twenty years experience in other methods of treatment, have pronounced unanimously in favor of antitoxin.

The writer denies Dr. Winters' statement that Variot is a firm believer in antitoxin, giving as evidence the title of the papers written by him on the subject. Again, Dr. Winters evidently failed to spend much time in the continental hospitals of which he writes.

The writer further gives ample evidence of continued improvement in the results from antitoxin all over the world. The most remarkable change of opinion has occurred among Germans regarding the value of intubation. Van Ranke and others now state that the use of antitoxin permits the earlier removal of the tube, and that they can now make use of intubation with advantage, where they formerly employed tracheotomy. Especially remarkable is the report of Kitasato of Japan. Out of 353 cases treated, there were 31 deaths, 8.78 where the previous mortality was 56 per cent. Of 110 cases injected within forty-eight hours of the onset of the disease, all recovered.

In the foregoing it has been demonstrated that the position of Dr. Winters in regard to antitoxin does not stand the test of critical examination. His description of cases of antitoxin poisoning in the Willard Parker Hospital has no sound basis in fact, and it has not been confirmed by other observers, though it was published to the world more than a year ago.

DIPHTHERIA WITH AND WITHOUT ANTITOXIN.

By William L. Stowell, M. D., New York.

From the N. Y. Med. Record, June 20, 1896.

The writer compares the mortality of diphtheria where antitoxin is used with that of the disease under other plans of treatment.

He makes reference to 7,262 cases of the latter variety, with a mortality of 644 or 8.8 per cent. These cases are collected from 37 different sources, and include reports from Europe and America. The following plans of treatment were used: Turpentine, oil of eucalyptus, vapor, iron, carbolic acid and lime water, iron and hydrogen peroxide, carbolic acid in tonsil, chlorine in tonsil, iron locally, petroleum locally, iron and toluol, iron and mercury, papayotin and peroxide of hydrogen, nitrate of silver, mercury, bichloride of mercury, cyanide of mercury, chinoline 5 per cent, precipitated sulphur, iron and sodium hypophosphite, bromine, chloral locally, and borax. His conclusions are:

That diphtheria is very variable in extent and severity, both epidemically and clinically.

That the diagnosis of true or false diphtheria requires as much care bacteriologically as clinically.

That the unusual number of cases recorded is in part due to bacterial cases without symptoms and the general alertness of physicians now to report suspicious cases.

That the same causes plus elimination give the apparently low ratio of deaths.

That cleanliness and ventilation will immunize as well as hypodermic serum.

Diphtheria is a treacherous disease under any treatment. Selected cases and faithful treatment of any reasonable kind leads to success. Jules Simon was correct in saying, "Efficiency of remedy not only, but fidelity in use" gives results.

PERSONAL EXPERIENCE IN THE TREATMENT OF DIPHTHERIA WITH AND WITHOUT ANTITOXIN.

By P. H. Ernst, M. D., New York.

From the New York Med. Record, June 20, 1896.

Since May, 1895, the writer has treated 77 cases of diphtheria, the diagnosis of which was confirmed by bacteriological examination, of which 12 were treated with antitoxin and 65 without.

Of the latter, 42 were severe and 23 mild cases. Eleven died (17 per cent). Of the 12 patients treated with antitoxin 7 (58.3 per cent) died.

ANTITOXIN IN THE TREATMENT OF DIPHTHERIA.

By E. W. Sanders, M. D., St. Louis.

From the Medical Fortnightly, June 1, 1896.

The claims of antitoxin are as fully established as vaccination, and the extent of its usefulness is alone to be determined. This has not been decided because in hospital practice the cases when admitted are often past the stage when antitoxin is most effective, and in private practice the results are vitiated by combination with other plans of treatment, by selection of the severer cases alone for serum injections, by inadequate dosage and by unjustifiable delay. The ordinary treatment of diphtheria by mercurials, salicylates, chlorates, carbolic acid, has been found incompatible with serum treatment, while pilocarpine, strychnia, caffeine, nitro-glycerine and tonics are its most necessary adjuvants.

Unquestionably a single large dose of serum given at the earliest possible stage of the disease gives the best result.

Antitoxin immunizes the organism against the toxins within twenty-four hours after its injection, and it is therefore useful to secure elimination of the poison as far as possible during that time. This is best accomplished by pilocarpine, which the writer systematically uses. It is administered hypodermatically, or by mouth to the point of continuous salivation; when the effect of the antitoxin becomes manifest, there is no further indication for pilocarpine. The effects of antitoxin are, first, in twenty-four hours, absolute cessation of the spread of the membrane; second, rapid subsidence of the swollen lymphatic glands; third, re-establishment of all normal secretions. As soon as antitoxin convalescence manifests itself, strychnia in full doses should be exhibited and continued until all danger of paralysis is passed.

Excluding cases of mixed infection, the greatest number of deaths is due to neural degeneration and consequent paralysis.

For post-diphtheritic heart failure, the following measures are indicated: Nitro-glycerine, hypodermic administration of caffeine, strychnia and brandy, liquid nourishment in small quantities.

The efficiency of antitoxin as a prophylactic is beyond all question. In the Bethesda Foundling Asylum and the Episcopal Orphan's Home, children exposed to infection are given an immunizing dose, and in no case has diphtheria developed within the limit of the time of the immunity so conferred.

The writer prefers the antitoxin which is preserved with trikresol. 2000 to 4000 antitoxin units should be administered to a child of seven. Frequently joint pains, urticaria, swelling of the hands and face follow the use of diphtheria serum. The writer concludes by expressing the opinion that the streptococcus serum will prove a powerful adjunct for cases of mixed infection.

SEVERE POST-DIPHTHERIC PARALYSIS IN AN ADULT TREATED BY ANTITOXIN.

By George T. Mundorff, M. D., New York.

From the New York Med. Record, June 27, 1896.

John M., aet. 20, was taken with a severe attack of diphtheria on Dec. 25, 1895, for which he received internal medication but no serum. A few weeks after convalescence his articulation became indistinct, deglutition embarrassed, voice, slightly nasal in character. In addition he suffered from double vision, scanty urination and constipation; walking became difficult and finally his arms became powerless. Examination showed that patient was anaemic and emaciated, muscles of trunk and extremities visibly atrophic, patellar reflexes entirely absent, pupils widely dilated, vision slightly impaired, voice hoarse, velum palati partially insensible to touch and motionless, isthmus of the fauces and pharyngeal walls slightly anesthetic, uvula motionless and atrophied, feet cold. Application of electricity to various muscles elicited very weak response.

Diagnosis: Post-diphtheritic paralysis.

Treatment: 750 units of antitoxin were given above the right rectus abdominalis on March 4, 1896, followed by no fever. Noticing gradual improvement, 1000 units were given on March 13th, since which time there has been a marked improvement and a gradual disappearance of former symptoms.

ABSTRACTS FROM CURRENT NEUROLOGIC LITERATURE.

BY WENDELL REBER, M. D.,

POTTSVILLE, PA.

COMPARATIVE OBSERVATIONS ON THE INDIRECT COLOR RANGE OF CHILDREN, ADULTS AND ADULTS TRAINED IN COLOR.

Luckey, (*American Journal of Psychology*, Jan., 1895), in the above investigation, selected as his subjects, six 7-year-old children, six 13-year-olds, and six adults of trained color perception. Incidentally he confirms the results obtained by Kirschman, Fick, and Raehlman in the following facts; that the ranges for the different colors were from 1° to 2° greater when the colors were moved from the center toward the periphery than when they were moved from without toward the center; that the colors seem to fall into two noticeable groups—the blue-yellow group and the red-green group; that, as shown by Raehlman, all the colors used entered the field of color vision as either blue or yellow.

The author states that blue is the most stable of all colors. It is never mistaken for any other color, enters the sensitive color field as blue, and remains blue throughout the entire field. Green comes next to blue in permanency and yellow is perhaps the most variable. Another fact of interest is that violet is seen as blue a degree farther than the blue itself, but is not recognized as violet until within the range for green.

The purpose of the investigation was, however, less to study the general subject of peripheral color vision than to answer the following questions:

Can children see colors in indirect vision as far as adults?

Does sex have anything to do with difference in the range?

What influence has color education on the range?

The estimations were made on the perimeter. The author considers that all estimations on a plane surface beyond an angle of 30° to be faulty. (He designates the plane surface apparatus

a campimeter). With the children he had great difficulty in securing steadiness of fixation, a point which he overcame by watching the child's eye during the entire test.

The general form of the visual field is, in all cases, somewhat elliptical but more circular in youth. The extent of the visual field is evidently larger in the adults, and so uniformly is this the case that it seems safe to answer the first question, "Can children see colors in indirect vision as far as adults?" in the negative. Representing the average for the adult eye for the four colors as 100, the average for the thirteen-year-olds would be represented by 77 and for the seven-year-olds by 61. This expressed in retinal surface would show a ratio of 100, 59 and 37 respectively. The question why cannot children see color in indirect vision as far as adults now forces itself. There are just as many degrees in the child's eye as in the adult's, and so far as is definitely known, the retinal layer extends as far forward in the one as in the other. The difference in the convexity of the crystalline lens favors the child. We can hardly account for it through inattention, for the thirteen-year-olds seemed to be able to give as close attention to the approaching color as the adults, yet they could recognize color only $\frac{3}{4}$ as far.

Beginning with the visual color field as seen by the adult and passing backward toward and through the visual field of the child, we notice that the field not only decreases in extent but also becomes more circular. The same is true of the form field, only the later decreases much less rapidly, or, in other words, shows a much greater proportional range in children than the color field.

Judging from all the evidence at hand, it seems probable that the child inherits from past generations an ever increasing color tendency, but nothing more; that he must come in contact with the real colors, or in other words, the different color stimuli must play on the retina in order to develop this color tendency into a real mechanism for the discrimination of color; and that this mechanism begins to develop in earliest childhood, and by slow development is finally completed in adult life.

The second question was: Does sex have anything to do with difference in color range? The author's figures, as far as they show anything, would indicate that man possesses not only equal power of recognizing the fundamental colors, but also equal retinal surface sensitive to color. [An opinion from the first part of which we must firmly dissent.]

The author's observations on adults trained in color differentiation were controlled by experiments on an equal number of selected university students. His color trained patients were art students. He wisely prefaces his conclusions on this last work as follows: "We mean something quite different, however, when we speak of direct color education. When an individual receives color instruction, the colored objects are not brought to play on the periphery, but on a small spot at the center of the retina, and here all color education or training in the general acceptance of the term takes place. There is, therefore, no reason for thinking that those trained in direct color vision ought to see farther in indirect vision than the untrained." Out of the investigation came the fact that color training does not seem to increase the color range (except perhaps in the case of red), but makes itself felt in a greater variety of shades and tints to the colors as seen in indirect vision, and less accuracy in naming the fundamental colors by direct vision.

THE INFLUENCE OF THE COLOR OF SURFACES ON OUR ESTIMATION OF THEIR MAGNITUDE.

Quantz (*American Journal of Psychology*, Vol. VII, No. 1), in opening this subject, points out that the apparently increased diameter of the rising moon is one of the most generally known optical illusions. He observes that for this phenomenon there are different explanations, but that whatever the true explanation may be, there is one point that has been overlooked; namely, that when the moon appears very large at the horizon, it has always a strongly orange or reddish color. The same is the case with the rising and setting sun; it can be readily observed that the phenomenon is less conspicuous when the reddish color is absent. This, however, does not prove that the redness of the moon is one of the causes of the illusion. The two phenomena may be traced back to the same cause. It may be, for example, that the moisture of the atmosphere, which causes the red color by its absorption of the more refrangible rays of light, is also, on account of the dimness in which distant objects appear through it, the cause of our illusion. But it remains a question of interest whether this red color has anything to do with the geometric optical illusion. From this particular phenomenon arises a more general question: Has the quality of light sensations an influence on the estimation of size? With a view to the solution of this problem, the author experimented with colored objects of various sizes, demonstrating that when colored surfaces of moderate size are seen on a darker

background the colors of the less refrangible part of the spectrum, and also reddish purple, show a decided tendency towards overestimation in space-extension, while for the more refrangible colors of the spectral colors a marked underestimation takes place. Our judgment of the equality of surface magnitudes shows a rather high degree of accuracy, which is for white but little greater than for colored surfaces. White or colored surfaces of moderate size, seen on a dark background, are underestimated in size when seen in motion toward or from the eye.

ON THE VISUAL CONDITIONS IN IDIOCY.

According to Petersen (Amer. Journal of Insanity, July 1896), between 7 and 8 per cent. of idiots are congenitally blind. It is necessary to determine whether the blindness is due to defect of the visual apparatus or to lack of attention. Blindness does not preclude the possibility of education, for some idiots with defect of this sense may be educated to some degree. When the idiots can look, without in reality seeing, the apparent blindness is due to a complete absence of attention. In idiots less affected, a greater variety of objects will attract their attention. In the higher grades of idiocy (imbecility and feeble-mindedness), vision may be as good as in normal man. But many present certain visual and ocular defects, such as hypermetropia, defective color vision, strabismus, nystagmus, congenital cataract, inequality of the pupils, microphthalmus, and the like. In hemiplegic idiocy or imbecility we may find hemianopsia. But the determination of the acuity of vision is difficult in this class of individuals. The perception of different colors is often possible in the milder degrees of idiocy. Good binocular vision is uncommon in idiots. The normal child takes pleasure in the sight of objects as early as the 11th day, the eyes are normally co-ordinated by the end of the second month, and he begins to distinguish colors correctly about the age of two years.

ON THE AUDITORY CONDITIONS IN IDIOCY.

Peterson (vide supra) finds that, in idiocy, the ears present conditions closely analogous to those of the organs of sight. It is not always easy to determine whether an idiot is deaf from defect in the auditory apparatus or only sensorially deaf. Idiocy of mild degree is not infrequently induced by deprivation of this sense. In the higher grades of idiocy, hearing is nearly always normal. Deaf-mutism can not be considered as common. The normal child hears on the fourth day, and is pleased with music in the second month.

THE PUPILLARY CONDITIONS IN PARETIC DEMENTIA.

Dr. Neff, of the Eastern Michigan Asylum, Pontiac, Michigan, in a study of 57 cases of paretic dementia, observed pupillary irregularity in 25 cases or 61%; the pupillary reflex was normal in 49 cases or 86%; the pupillary reflex was sluggish in 14 cases or 24%; and the pupil reflex was absent in 3 cases, or 6%. The study embraced both males and females. The findings would rather indicate that the physical signs in females are more constant than in the opposite sex. (*Amer. Journal of Insanity*, July, 1896.)

REMARKS ON THE PROJECTION SYSTEM OF THE HUMAN RETINA.

Prof. Flechsig in the *Neurol. Centralbl.* No. 1, 1896: Most of the bundles of projection fibres, in their course to the cortex, choose the shortest pathway, taking a radial course from the internal capsule to the cortex. Some divisions of this system, however, take considerable round-about ways, which fact is of importance for the topical diagnostics of cerebral diseases. Among the bundles taking such unusual course, the inferior longitudinal fascicle deserves special mention. This bundle has heretofore been considered as an association tract connecting the occipital lobe with the entire temporal lobe, including its anterior portion. Flechsig observes that this tract does, indeed, end posteriorly in the occipital lobe, especially in the visual area; anteriorly, however, its fibres do not connect with the cortex but with the optic thalamus. From the occipital lobe these fibres go over into the temporal lobe, in which they pass forwards as far as the region lateral and backward of the nucleus amygdalæ. Thence they go upward partly under an acute angle, encircling the inferior part of the lateral ventricle anteriorly. In the thalamus they become connected partly with the basal portions of its lateral nucleus or with the "schalenförmiger Körper;" in part they ascend at the posterior surface of the pulvinar and enter the principal nucleus.

The inferior longitudinal fascicle is, accordingly, nothing else than a part of Gratiolet's optic radiations. This fascicle probably does not serve exclusively for the conduction of visual impressions, but presumably contains also centrifugal pathways, securing to the visual area an influence upon muscular motions, etc. (*Journal Nervous and Mental Disease*, Aug., 1896.)

ON THE VISUAL QUALITIES.

It has been customary to accredit sight with about 41000 qualities of color and brightness. The scattered statements in the literature seemed to justify the assumption that there were some 800 distinguishable brightnesses between the limits of the deepest black and the most dazzling white; some 200 distinguishable colors in a solar spectrum of average intensity; and some 200 distinguishable degrees of saturation for each of these 200 qualities, (not 800, as might be imagined, since brightness discrimination suffers very considerably by the intermixture of homogenous with the mixed light); in all, 41,000, more or less, and probably more. Professor Koenig has recently computed the number of discriminable spectral colors and the number of brightnesses from limen to terminus of stimulation. He gives the former as 160, the latter as 660. If these numbers are correct, the total falls to about 33,000. It may very well be, however, that Professor Koenig has underestimated the number of qualities on the brightness scale. (American Journal Psychology, Vol. VII, No. 1.)

OPHTHALMOPLAGIC MIGRAINE.

In a clinic, at the Hospital St. Antoine, M. Gilbert Ballet showed and discussed a case of the infrequent disorder for which Charcot proposed the name of "Ophthalmoplegic Migraine." In examining the patient the most conspicuous symptom was the drooping of the right upper eye-lid and the possibility of elevating it to only a slight degree, due to paralysis of the levator muscle. This was found to be accompanied with paralysis of the right internal rectus, paresis of the superior and inferior recti, and a decided affection of the superior oblique; the inferior oblique and the external rectus were untouched. Complete iridoplegia was present.

The interest of the case lies more in its development than in the total ophthalmoplegia. The patient, aet. 37, had experienced the first attack in his 14th year, after which he had five more, of which the one described was the last. The trouble had begun with a pain in the left supra-orbital region, which crossed to the right side after a day or two, and there remained in a somewhat more extended area, affecting the ocular, the supra-orbital and the parietal regions. In addition to these characteristic migrainous symptoms the patient showed some cardiac disturbances and nausea, altogether like a typical hemicrania.

Ordinarily in this disease the pain ceases instantly upon the appearance of the paralysis; in the present instance this was not the case. When the paralysis appeared the pain was lessened, but did not subside entirely. The motility of the eye was perfect in the intervals of the attacks, though not so good between the last two.

The disorders from which this would have to be differentiated in practice are the occasional passing paralyzes of the third nerve, sometimes seen in tabes, and a cerebral growth or a meningitis, especially of the basal variety, which might give rise to oculo-motor palsy even of the periodic kind, thus closely resembling the relapsing attacks of ophthalmoplegic migraine. In case of brain tumor it would be readily distinguished by the distinct signs of an increase in volume of the cerebrum. (*Journal Nervous and Mental Disease*, July, 1896.)

AN OBSCURE CASE OF BILATERAL DEAFNESS FOLLOWING INJURY.

At a meeting of the Philadelphia Neurologic Society held April 27th, 1896, the following interesting case history was presented: J. D., married, aet. 26. Was well up to three years ago, when he fell a distance of 12 feet in a boat. He was unconscious for two hours afterwards. With returning consciousness it was noticed that he had become entirely deaf. There was slight oozing of blood from the right ear. The deafness has continued without change since the accident. No other symptoms were noted afterwards. He does not complain of headache, has no vertigo, and the pupils are equal in size. Examination of the ears negative. Careful examination with the tuning fork utterly fails to reveal any bone conduction. Professor MacCuen Smith reports total deafness. Patient states that he can feel sudden jars but cannot hear them. A careful examination of the eyes by Dr. De Schweinitz is also negative. The case is presented because of its unique character. Unilateral deafness after falls on the head is, of course, not uncommon. Bilateral deafness, and especially total deafness (that is, absence of bone conduction) is certainly very rare. It is hardly safe to venture a diagnosis as to the seat of the lesion. Double labyrinthine hemorrhage is conceivable and perhaps possible, though very improbable. Extensive basal fracture is out of the question from the history of the case as well as the entire absence of other symptoms. Is it not possible that a minute hemorrhage occurring in the neighborhood, or into the substance of the posterior quadrigeminal bodies may account for

the condition found? In the discussion, Dr. Wm. Spiller remarked that the fact that there had been no facial paralysis forbade locating the lesion in those parts in which the auditory and facial nerves lie close together. For the same reason, it could hardly be located in the medulla oblongata; it could scarcely assumed that isolated destruction of the former by a traumatism could occur. The man had ringing in his ears which at times was severe, and occasionally resembled the sound of a distant waterfall. This latter symptom has been considered as common in labyrinthine disease. (Journal Nervous and Mental Disease, July, 1896.)

SOME CASES OF RETINITIS.

BY J. H. McCASSY, M. A., M. D.,

DAYTON, OHIO.

CASE 1. — Retinitis of Bright's Disease.—Mr. L., aged thirty-eight years, having a good family history, consulted the writer in February, 1894, in order to procure a pair of glasses. He complained of headache, dizziness and impaired vision. Vision R. E. 20/100, L. E. 20/120. Examination with the ophthalmoscope showed inflammation of the interocular end of the optic nerve papillitis. The outline of the disk was confused and hazy, the blurring being due to effusion. The disk was swollen and the veins enlarged. There were whitish patches in the retina, especially between the optic nerve and the macula. The writer knew the patches were in the retina because they interfered with the course of the retinal vessels. There was an exudation which covered the retinal vessels in spots; in other portions the vessels were uncovered and clearly defined. If the exudation were in the choroid, the retinal vessels would not be obscured in this manner. Later on the fundus appeared like a "mackerel sky" in full sunshine, with numerous fleecy and bright clouds. Indistinct hemorrhages were scattered here and there. A circle of white dots, stellate in appearance, studded the macular region. His family physician gave him treatment consisting of regulated diet, with a preponderance of milk, regular baths and tonics consisting of iron, arsenic and ammonia, but all was of no avail; his disease proved fatal in sixteen months.

CASE 2. — Albuminuric Retinitis.—In April, 1888, the writer was called to see Mrs. M., aged nineteen years, who was suffering from headache, dizziness, swelling of the legs, and partial loss of sight. Her pupils were fully dilated and did not respond to light. She was seven months gone in gestation. Repeated examinations of her urine showed that about one-half of its bulk consisted of albumen. The ophthalmoscope

showed swelling of the optic papilla, obscuration of the larger vessels of the disk, and white patches in the central portion of the retina. The writer apprised her husband of the danger she was in, and asked for consultation with a view to the induction of premature labor in order to save her life. But this was refused. The writer, however, decided to call in counsel, but his colleagues could not be procured just then, and consultation was postponed. The writer (who was still doing some general practice), had the patient on treatment consisting of rest in bed, baths, cathartics, diuretics, diaphoretics and tonics of iron and quinine for about six weeks. On Saturday morning a fourth of a grain of pilocarpine was administered hyperdermically, and three hours later a fourth of a grain of morphine was given in like manner to allay a convulsive tendency. During the afternoon vomiting set in and miscarriage took place. Her recovery was uneventful; she regained complete vision. Eight years have passed; she has borne no children since, and has had no return of albuminuria. Owing to the imperfect nutrition of the foetus, on account of impoverishment of the blood by the drain of albuminous materials through the kidneys, albuminuria strongly predisposes to abortion. It was a God-send in this case.

CASE 3.—Retinitis Syphilitica.—Mrs. D., aged thirty-two years, consulted the writer in October, 1895, for impairment of vision. She confessed syphilitic history, infection having taken place one year prior. Her hair had all fallen out. In R. E. D. V. was 20/200 and L. E. D. V. was 20/120. The ophthalmoscope showed the disk hazy and the retinal vessels clouded. Hemorrhages are rare in syphilitic retinitis. There was only one small hemorrhagic spot in the left eye in this case. She was put upon treatment consisting of hot baths, one grain tablets of calomel nearly every night, followed by a teaspoonful of Epsom salts in the morning; a quarter grain pill of the protoiodide of mercury was given three to five times daily; one to two drachms of iodide of potassium was administered daily. At the end of six weeks of this treatment, her vision returned to nearly normal. Against the protestations of the writer, she dropped treatment and went away on a visit. But in two months she returned for treatment and was much alarmed as her vision was as bad as it had been before. Nearly the same line of treatment was followed. Later on the cathartics were displaced by Aiken's tonic. Treatment was kept up for six months. Vision in R. E. was 20/40 and the L. E. 20/30.

The neuro-retinitis in this case was complicated by choroiditis.

CASE 4.—Retinitis traumatica—Mrs. W., aged forty-seven years, the daughter of a Lutheran minister, while breaking coal, a piece of it struck her violently in the right eye lid compressing her eye-ball through the lid. In about two weeks' time the vision of this eye grew dim, particularly on looking straight ahead. Vision on the side was fairly good. The ophthalmoscope showed haziness and swelling of the papilla and obscuration of the vessels of the disk and fundus. There were marked lenticular changes. The treatment was iodide of potassium and tonics. The patient was under treatment but a short time when she moved to another city and the writer lost track of the case.

CASE 5.—Chorioretinitis.—Mr. H., aged thirty years, consulted the writer February 24th, 1896, complaining of loss of vision in his left eye, which had come on in a week's time. The patient, a hotel clerk, was under the care of Dr. J. S. Beck, for pulmonary tuberculosis at the time. He had frequent hemorrhages and was quite anaemic. The ophthalmoscope showed swollen disk; abundant plastic exudations dotting the retina in its periphery, obscuring the course of the blood vessels in places. Slight agitation of the eye would raise a dense cloud of floating opacities. There was no syphilitic history. Repeated examinations of his urine excluded the possibility of albuminuria or glycosuria. The case was regarded as occurring idiopathically, complicated with anaemia and tuberculosis. The treatment consisted of grain doses of calomel in tablet form once a day to once every few days; quarter grain pill of protoiodide of mercury three to four times daily; and potassium iodide one drachm daily. Vision was greatly improved in three weeks, and entirely restored in two months under this treatment. Only a few of the opacities in the vitreous remained.

CASE 6.—Retinitis complicated with paralysis of the right side.—Mrs. M., aged thirty-five years, a niece of Horace Greeley, with a good family history, was attending a trial in a crowded court room, December, 1895. The trial was very exciting. A young woman was convicted of having killed her mother. The patient suddenly became unconscious, and her face was greatly distorted. The Court Judge was the first to notice the mishap, and had the patient removed to the open air. The ambulance conveyed her to her home, a distance of four blocks. Her family physician, Dr. Kline, has had charge of

the case ever since, a period of eight months. After the case had progressed two months, the writer was called in consultation. The patient was suffering from complete motor paralysis of the right side, aphasia and dimness of vision. Vision 20/180. The ophthalmoscope showed a woolly disk and exudations in spots, which obscured the retinal vessel. Treatment—one drachm of iodide of potassium was administered daily for three months. A part of this time four to six drops of Fowler's solution of arsenic was added to the iodide. Pill—aloin belladonna and strychnine was used freely to counteract obstinate constipation. The faradic current of electricity was also used. Five months after she received the "stroke of paralysis," she had recovered the use of her leg and arm, the aphasia had disappeared, and her vision had improved to 20/30. The disk and retina had assumed their normal appearance with the exception of slight haziness. The ocular symptoms in this case were secondary to clots or to plastic effusion into the brain.

CASE 7.—Retinitis due to atheroma.—Mr. W., aged sixty-four years, a carpenter by occupation, having a good family history, consulted the writer in April, 1896, for loss of sight in his left eye. He could scarcely count fingers at any distance. While recently on a visit to his son in Colorado, he exerted himself a good deal in climbing mountains, and the result was hemorrhagic retinitis. Repeated examinations of his urine failed to reveal the presence of sugar, albumen or casts. He was given a grain of calomel once a day to once every few days, followed by a teaspoonful of Epsom salts, quarter grain doses of pilocarpine were tried, followed by sponge baths. A drachm of the iodide of potassium was also administered daily for one month. His vision improved somewhat. He then left Dayton, and the case was not traced further. Atheromatous arteries were the causal factor in this case.

CASE 8.—Retinitis pigmentosa.—Miss D., aged twenty-two years, a house-maid, whose father and mother were first cousins, noticed that for six or seven years there was gradual diminution of her vision, and particularly in the range of her vision. She complained of much greater defect of vision while working by artificial light—night blindness. The ophthalmoscope showed pigmentary deposits in the peripheral portions of the retina. As time went on there was more and more limitation of the field of vision concentrically. The process was so slow that she might see fifty or sixty winters before she would lose all her sight. Her two sisters, aged fifteen and eighteen years respectively,

were similarly affected. Night blindness was the first symptom that attracted their attention. Choroidal atrophy, vitreous opacities and involvement of the optic nerve were absent in these cases. As usual, both eyes were similarly and simultaneously attacked.

Remarks: A patient having albumen or sugar in his urine persistently accompanied by progressive impairment of vision, it is reasonably certain that he has retinitis, due to the altered condition of the blood in these maladies. Retinitis occurs very late, if at all, in diabetes. In cases of progressive loss of sight, where there is unquestionable syphilitic infection and no outward local inflammatory trouble, in all probability there is retinitis or neuro-retinitis syphilitica.

NOTES AND ANNOUNCEMENTS.

(Under this heading the Annals will publish items of interest to its subscribers. Please address Dr. Casey Wood, 103 East Adams St., Chicago.)

Dr. J. W. Ray announces his removal to 423 West Chestnut St., Louisville, Ky.

Dr. Walter Park, of Harrisburg, Pa., spent August in the Adirondacs and Berkshire hills.

Dr. Gilles de la Tourette has been appointed physician-in-chief for the world's fair of 1900 in Paris.

Dr. C. A. Oliver is again in harness, in Philadelphia, after a two-months' sojourn at his beautiful home on Nantucket Island.

Professor Arthur Barth, of Marburg, well known for original work in otology, has gone to Danzig, as successor to Wilhelm Baum.

Dr. W. E. Casselberry has returned from Lake Forest to his city residence, and re-established his regular office hours in Chicago.

The many friends of the distinguished Dr. T. E. Murrell will be glad to learn that the doctor's health is much improved. He is now at Denver, Colo.

The first of the month marked the opening of Dr. de Schweinitz's lectures at Jefferson Medical College, and of Dr. Wm. Norris' lectures at the University of Pennsylvania.

Dr. Nicholas Ruedinger, for many years head professor of anatomy at the University of Munich, and one of the editors of the *Monatsschrift fuer Oehrnheilkunde*, died in August.

Prof. Förster having resigned his position at the University of Breslau, Prof. Uhthoff, of Marburg, has been appointed to succeed him. Dr. C. Hess has been appointed to Marburg.

A Source of Infection.—It is well known among oculists that the opera glasses which may be hired in most theaters frequently become the medium for spreading very serious eye diseases.—Pop. Science News, August, 1896.

Physicians desiring to attend this meeting, and those intending to read papers, should address Dr. W. Scheppegegrell, New Orleans, Chairman of the Southern Section, American Laryngological, Rhinological and Otological Society.

Billroth attended Ferdinand von Arlt during his illness at Vienna, where he suffered from thrombus in the left popliteal artery. The Festsrede of Fuchs has brought to light some interesting details of the character of the two men.

Bernhard Frankel, director of the Rhino-Laryngological Clinic at the University of Berlin, will celebrate his seventieth birthday Oct. 17th. We take great pleasure in extending sincere congratulations to a learned investigator and conscientious teacher.

Following the recent establishment of a full professorship in ophthalmology, the University of Pennsylvania has taken that branch out of the elective column and made it compulsory in the third and fourth years. This is an example worthy of emulation.

We understand that a project is on foot to establish an ophthalmological society for the Middle States. The intention is to have frequent meetings in and for certain localities, and general meetings at some central point, twice a year, for the convenience of the whole membership.

Dr. Ricardo Botey, of Barcelona, has been appointed Spanish delegate and secretary of the sections on Otology (XIIa) and Rhinolaryngology (XIIb), at the next meeting of the Int. Med. Congress at Moscow. He has selected as his subject: "Treatment of Mastoid Suppuration, with its Cerebral Complications."

At the third annual meeting of the American Academy of Railway Surgeons, held at Chicago, Sept. 23, 24 and 25, four papers were presented on "Wounds of the Eyeball." Dr. Robt. Tilley, of Chicago, read an essay on "The Personal Equation among Trainmen; its Importance Equal to or Greater than the Color Sense."

An historical exhibition of ophthalmoscopes has been arranged by the well-known optician, Emil Sydow, for the Industrial Exposition at Berlin. The suggestion came from Dr. R. Greeff, and has been well carried out. There are about 60 instruments in all, some models, some in duplicate, illustrating the history of the science, from the first construction of Helmholtz to the most modern production of binocular ophthalmoscopes and autoscopes.

Rudolph Schirmer, professor (retired) at the University of Greifswald, died the 27th of January, 1896. His whole professional activity had been spent in this, his native town, and all his life ophthalmology was his special field. Not so well known, perhaps, as other German professors, his personality left a great impress on his country; for his energies were directed rather to the practical development of his science and art, than to literary production; and he lived to see his field grow from a mere branch of the surgical hospital,

where he was his own clinician, register clerk, assistant, nurse and general servant, into one of the most thoroughly equipped and organized ophthalmic hospitals of the world. He died "in the happiness of feeling that his ambition had been achieved." His son, Otto, succeeds him.

The meeting of the Southern Section of the American Laryngological, Rhinological and Otological Society, will be held in New Orleans, March 3 and 4, 1897. This date has been selected for the reason that it will enable visiting members to see New Orleans during the Mardi Gras Carnival season, and will also enable them to secure half-rate railroad transportation.

A System of the Diseases of the Eye, Ear, Nose and Throat, of one thousand pages, liberally and finely illustrated, and written by American teachers, will be published next year by Saunders, of Philadelphia. The work is edited by Geo. de Schweinitz and B. Alex. Randall, of Philadelphia. Among the contributors are several of the editors of the Annals of Ophthalmology and Otology.

The July issue of the Annals assumed unwieldy proportions, and was somewhat delayed, in consequence of the attempt made by its editors to present a full report of the numerous midsummer meetings of the various ophthalmologic and otologic societies and sections. To prevent a recurrence of this, we have been obliged to hold for the January issue a large amount of matter intended for the current issue.

The last number of the Ophthalmic Record contains the announcement that the journal will in future, provided a certain number of subscribers are guaranteed, be published in Chicago. The Record has, since the issue of its first number, been one of our most enterprising and attractive periodicals, and we trust that its popular editor, Dr. G. C. Savage, will continue to retain an active share in its management, should it be deemed wise to continue the publication.

In the report of the discussion of a paper, read at the last meeting of the American Medical Association on "Sub-conjunctival Infections," Dr. de Schweinitz (these Annals July, 1896, p. 731) is made to say that "In neuritis and episcleritis they act promptly." As members of the ophthalmologic section then present will very distinctly remember, de Schweinitz stated that, in his experience, these agents exert no remedial influence whatever upon diseased processes in the optic nerve.

We are glad to learn that Dr. Russell Murdoch, of Baltimore, has returned from Europe safe and sound. His extensive examinations of the eyes of the lower animals—especially of the larger carnivora—had the element of danger added to those sensations that commonly flow from successful investigations in new fields. The results of these studies have, *inter alia*, confirmed his previous observations, viz.: that all the ungulates have oval corneas and sclerotics (posterior poles), and all the birds round corneae and sclerae. He reports that Dr. Geo. Lindsay Johnston is about to publish a comprehensive work upon this subject, mainly composed of personal observations extending over many years.

The history of the Popow Eye Institute at Klew, with a review of past and present methods of treatment, has been carefully reviewed in a publication prepared by Dr. E. Neese, the surgeon in charge. The object of the hospital (to prepare a way to prevent the spread of trachoma and the prevalence of blindness among the Russian peasantry) was made possible by the munificence of the Russian merchant Popow. The publication is a splendid resume of modern ophthalmology.



We clip the following from the September issue of Lippincott's: "Of much original value is an excellent little volume called *The Eye and its Care*, by Frank Allport, M. D., just put forth by the J. B. Lippincott Company, and intended not for practitioners, but for the layman and for schools. It is a great desideratum in our contemporary life of daily drive and overwork, that we should know more about the organs of our bodies which most suffer under the extreme pressure. Ignorant misuse of the eye brings severe punishment to its neglectful or uninformed possessor; but unless some such book as this is put in his hand, it is difficult to conceive how he is to be warned of his folly.

"Dr. Allport comes to his work with ripe experience and scientific training. He is the Professor of Ophthalmology in the Minnesota State University, and a member of many of the learned bodies of Minnesota. He has discovered earlier than his fellows the need of such a text-book as this, which has long been a patent necessity to patients, and his little book will be welcomed for its clear statements about the eye, its structure, its treatment, its limitations, and its uses, with the distinct object in view of perpetuating good eyesight for present and future generations. The dedication to Dr. Charles A. Oliver is a deserved compliment to an eminent associate."



The following resolution was recently passed by the Wisconsin State Medical Society at Madison—proposed by Dr. H. V. Würdemann, of Milwaukee:

Whereas, There are in the United States several thousand who have become blind because of ophthalmia neonatorum; and

Whereas, This unfortunate result is largely preventable, being due to the neglect of nurses and midwives; therefore,

Resolved, That it is the sense of the Wisconsin State Medical Society assembled at Madison, June the fourth, 1896, that a committee of three be appointed by the chair to urge such legislation as will tend to lessen the blindness caused by this disease.

Resolved, That the following law meets with the approval of the Society:

Section 1. Should one or both eyes of an infant become reddened or inflamed at any time after birth, it shall be the duty of the midwife, nurse or person having charge of said infant, to report the condition of the eyes at once to the commissioner of health, or to some legally qualified practitioner of medicine of the city, town or district in which the parents of the infant reside.

Section 2. Any failure to comply with the provisions of this act shall be punishable by a fine not to exceed one hundred dollars, or imprisonment not to exceed six months, or both.

Section 3. This act shall take effect on the first day of June, eighteen hundred and ninety-seven.

A committee of three was appointed by the President, Dr. Würdemann being named chairman.

The American Medical Association will meet in Philadelphia in June, 1897, and the officers of the Section of Ophthalmology have reason to believe that this occasion will attract a notable gathering of ophthalmic surgeons. Two special topics for discussion have been suggested by the Executive Committee, namely, "The Treatment of Trachoma," and "The Preparation and Care of Patients Requiring Corneal Section, with Special Reference to the Extraction of Cataract." These topics have been entrusted to ten gentlemen, each of whom will prepare a short paper upon a special subdivision of the subject. Papers on other subjects, especially those containing original investigation, will be welcome.

BOOK NOTICES.

HISTOLOGY OF THE HUMAN RETINA.

GREEFF, RICHARD (*Der Bau der menschlichen Retina*), *Augenärztliche Unterrichtstafeln*. Verlag von J. U. Kern, Breslau, 1896.

This number of the ophthalmic lecture charts contains a large schematic diagram for lecture purposes and three smaller ones which may be handed around the class; together with a brief description of the several parts of the retina. He follows the classification of M. Schultze in considering the hexagonal pigment epithelium to be a portion of the retina; dividing this membrane into ten parts. An excellent description of the macula lutea, peripheral portions of the retina and of the blood-vessels is likewise given. A valuable addition to this would have been actual micro-photographic illustrations, such as have been given in a recent article by Norris & Wallace published in the University Medical Magazine, March 1894.

H. V. W.

 THE GALLO-ROMAN OCULISTS OF THE THIRD CENTURY.

(*Les Oculistes Gallo-Romains. au troisième Siècle.*) H. Caals, Editeur, Antwerp, 1896. pp. 183.

In 1854, Duquenelle found in a box that had been lying for some time in a house at Rheims a collection of surgical instruments. From the appearance of the collection and from an inscription on the instrument case it was surmised that the original owner had been an oculist and had practiced his profession towards the end of the third century. Two medals of the reign of Pius Antoninus and Marcus Aurelius still further attested the latter fact. The name of the ophthalmic surgeon proved to be Gaius Firmius Serverus and the historian of his acts, in so far as they can be verified, has appeared in the person of Doctor Deneffe. On the whole this is an exceedingly interesting, instructive and entertaining volume inasmuch as it also throws much light upon the status of ophthalmology in those early times and furnishes a complete treatise upon the therapeutics of eye affections as administered by Serverus and his colleagues.

The practice of ophthalmology as a specialty was common not only in Rome and the larger Italian towns but in those civilized cities outside of Italy that obeyed the Roman rule. Thédenat has given us a long list of these, most of them freemen but at least one was a slave. They bore one of several titles indicative of their calling, "*Medicus ab oculis*," "*Medicus ocularius*," or "*Chirurgus ocularius*." These men not only made visits at the houses of patients but did an office practice at their *officinae*, or *tabernae*. The latter were apothecary shops and were well provided with the necessary surgical instruments, sponges, operating seats, etc., for all kinds of operations.

Collections of the so-called *collyria* have been found. These were when freshly prepared, of the consistence of wax and had stamped upon them sometimes the names by which they were known, or directions for use or, more frequently, they bore the imprint of the seal which every oculist carried. As now preserved they are as hard as stone having retained intact the impressions made upon their surfaces fifteen centuries ago. Dissolved in milk, water or the white of egg (according to the requirements of the particular case) they formed what corresponds to our modern collyria.

Thus the seal of Paternus, a well-known Roman oculist, bore the following inscription: *Lucii Caemii Paterni authemerum lene exovo, acre ex aqua.*

Numerous photogravures of instruments, medicine pots, etc., are appended to the book.

ANNUAL OF THE UNIVERSAL MEDICAL SCIENCES.

By Sajous, 1896. The F. A. Davis Co., publishers. Vol. IV, Section B, Ophthalmology, edited by Charles A. Oliver, A. M., M. D., assisted by Wm. Campbell Pusey, A. B., M. D.

One hundred and fifty pages are taken up with the report of the progress of ophthalmology during 1895. The report contains a vast amount of useful information gleaned from the various ophthalmological journals and text-books published throughout the world, and is compiled in such a manner that any subject can readily be referred to. Each anomaly and disease of the eye, as well as the abnormalities of the surrounding tissues relating to the eye, are reviewed under its own particular heading. Part of the section is devoted to the progress that has been made in medical ophthalmology, and to the subjects of therapeutics and new instruments.

The article contains a number of illustrations, and is printed in clear, large type.

WOODRUFF.

CONTRIBUTION TO THE PATHOLOGY OF THE LACHRYMAL GLAND.

BOCK, EMIL. (*Zur Kenntniss der gesunden und kranken Thränendrüse*). Verlag von Josef Safar, Wien, 1896.

There has been little of this subject in the literature and Bock has undertaken a praiseworthy work in making examination upon a large number of persons with sound and diseased tear glands. He describes the general picture of inflammatory change in the tear gland as follows: 1st. The orbital and lid portions of the lachrymal gland are of different position, relation and size in different individuals, varying in the examination of 176 healthy people from that of a non-noticeable size to that of a bean. 2nd. The uncommon cases of primary lachrymal adenitis when they are not directly caused by trauma are due to previous infection which is acquired either through the blood-vessels or comes through the conjunctival cul-de-sac or through the lachrymal orifices. 3rd. Examinations of 372 cases of eye disease show that the lachrymal glands are not uncommonly connected with swelling or inflammation of the inflamed conjunctiva. The diagnosis of this was made on account of slight swelling and on account of the dark red color of the glands seen through the conjunctiva and on account of the simultaneous swelling of the glands of Krause. 4th. In closing, Bock calls especial attention to the fact that in disease of the lachrymal gland its secretion is decreased and that the so-called "tearing" is to be ascribed to the increased moisture from the conjunctiva.

H. V. W.

ATLAS OPHTHALMOSCOPY.

OELLER, J. (*Atlas Ophthalmoscopie*), *Zweite Lieferung*. Verlag von J. F. Bergmann, Wiesbaden, 1896.

The second part of Oeller's Atlas of Ophthalmoscopy shows that the author and publisher have continued the high standard which was displayed in the first number. The fifteen plates with descriptive texts in German and English are beautifully drawn and colored. The only criticism that may be passed upon the work as a whole is that the coloring of the illustrations is too yellow, but seems to the editor an accurate reproduction of the color of the fundus as exhibited by the light from a coal oil lamp, such as is commonly used in Germany. The fundus reflex by American gas is of less yellowish tinge; that by electric light or daylight has scarcely a trace of yellow.

The want of detail in a few of the illustrations, for instance, that of A. Tab. V. *Fibrae Medullares*, together with the deep yellowish color of the fundus is in striking contrast to the color and detail in the illustration of a similar nature in the *ANNALS* of July 1896.

H. V. W.

NEW OPHTHALMIC FORMULAS.

(*Nouvelles Formules d'oculistique 1889-1895.*) By Dr. de Bourgon Paris; Société d'éditions Scientifique. 300 pp. 416 formulae.

This is one of the recent foreign publications that ought to be translated into English for the simple reason that while there is need of such a work nothing corresponding to it has been given to the profession in our language. Most of the remedies recently added to the *armamentarium ophthalmicum* are described in its pages and the writer has not neglected to quote his authority in each instance and has added to his little work (1) a pharmacologic index (2) a therapeutic index and (3) a list of authorities.

We note some errors and a few omissions. The useful formula containing hydrastin sulphate as its most active ingredient, first employed by Dr. X. C. Scott, in ophthalmic and allied diseases of the eye is not mentioned, nor are argentamin and arecolin. Wood's ophthalmic discs are noticed but the most important of all of them, the combination of cocaine with homatropin, is not spoken of.

C. A. W.

EYE OPERATIONS.

CZERMAK, WILHELM (*Augenärztlichen Operationen*), Druck und Verlag von Carl Gerold's Sohn, Wien. 1893-1896.

The 8th and 9th numbers of this most complete and excellent description of ocular operations has appeared. We have not before reviewed this work which has been appearing in separate parts during the last three years. The first number (published in 1893) considers instruments of all characters which are in present use for ocular operations. The second portion of the first number is devoted to *asepsis* and *anti-sepsis* describing the methods of caring for the instruments, of the operating and bed-room, of the surgeon's hands and of the area to be operated upon. The second number continues the description giving excellent illustrations and descriptions of the several apparatus for sterilizing instruments, bandages, etc., giving preference to dry or moist heat. The third section considers the preparation of the patient for operation and after-treatment. Heavy bandaging is adhered to. The fourth section treats of the operations upon the lids, upon the conjunctiva and the tear passages, which is continued through the third, fourth and fifth numbers giving excel-

lent descriptions of the various plastic operations. The 6th and 7th numbers begin with the fifth section considering operations in the orbit and upon the ocular muscles. The question of meningitis after enucleation in panophthalmitis, exenteration of the orbit and prosthesis oculi are given attention.

The 8th and 9th numbers continue with operations upon the ocular muscles closing the subject, commencing the 6th section with operations upon the bulb which are first generally considered and later taken up separately, beginning with operations upon the cornea.

The author states that the last number has been delayed owing to his change of residence from Vienna to Prag, by which he was unable to gain access to his library; but the forthcoming numbers will be regularly brought out.

This is the most pretentious work upon ocular operations that has yet appeared. The wood cut illustrations are fine and numerous, the type is plain and paper good. It is to be hoped that it will be translated into English as it should be in the hands of every oculist.

H. V. W.

A GUIDE FOR THE ESTIMATION OF THE BUSINESS CAPACITY IN IMPAIRED VISION.

GROENOUW, ARTHUR (*Anleitung zur Berechnung der Erwerbsfähigkeit bei Sehstörungen*). Verlag von J. F. Bergmann. 1886. 75 pp.

This is a timely contribution to a subject which has a somewhat sparse literature. The capacity for business of each individual depends greatly upon his visual acuity. His usefulness is, however, not directly proportional to the amount of the impairment of vision. For most trades the vision of $\frac{1}{2}$ or $\frac{3}{4}$ permits of good work. Magnus gives the following theorems of the dependence of the individual for work upon his functions and environment: 1. Normal performance of the organs of the body. 2. The technical accomplishment and knowledge which are necessary for the employment and which vary according to the individual. 3. The demand for the work of the particular individual upon the market (the law of supply and demand).

The various disturbances of vision and the amount of blindness thereby produced are considered in their relation to different trades and professions, especially as regards services of the State. The book is replete with mathematical formulae, has a number of statistical tables and diagrams. Literature is fully quoted.

H. V. W.

DISEASES OF THE EYE AND OPHTHALMOSCOPY. A HANDBOOK FOR PHYSICIANS AND STUDENTS.

A. EUGEN FICK, University of Zürich. Authorized translation by Albert G. Hale, A. B. M. D. 488 pp. P. Blakiston & Co., 1896.

This translation adds another to the list of medium-sized text-books on Ophthalmology and we are able to say that it is one of the best that has yet appeared.

Doctor Hale has not only done his work unusually well but has some pages on the subject of heterophoria that have greatly added to the value of the work. Of course it is not possible, in the case of a smaller text-book, to give a complete account of every department of ophthalmology but we must take exception to at least two errors of omission that have probably escaped the otherwise careful eye of the editor. Thus, on page 452, he says: "Operative treatment consists of the mechanical (surgical) weakening of the over-strong muscle by a tenotomy." Nothing is said about that very effective

remedy, advancement of the tendon of the weaker muscle. On page 327, the important subject of tobacco-alcohol amblyopia, its diagnosis, prognosis and treatment, is dismissed in seventeen lines. Surely a disease so prevalent both in this country and abroad deserves a more extended mention.

The illustrations are numerous (many of them colored) and as a rule they are well executed. The scheme of the optic tracts (after Monakow) is particularly well shown in red, blue and black and the same may be said of most of the black and white illustrations throughout the volume.

This manual has apparently experienced the difficulties commonly met with by those who employ colored illustrations of the fundus oculi when they are inserted in the text and printed on text paper, however excellent it may be. They are at best entirely diagrammatic as may be seen by reference to pp. 123, 374 and 398.

We are glad to note that there are no addenda, correcting misspelt or imperfectly translated words for the very good reason that we have come across, in our reading of this excellent translation, no examples of these defects. Both the author and the translator are to be congratulated upon the good work accomplished in this textbook.

FUNCTIONAL EXAMINATION OF THE EYE.

ELSCHNIG, ANTON (*Die Funktionsprüfung des Auges für Studierende und Aerzte*). Verlag von Franz Deuticke, Leipzig und Wien, 1896. (174 pp. with 31 illustrations.)

Considers physiological optics and correction of ametropia by lenses, accommodation, visual acuity, myopia, hyperopia, anisometropia, aphakia and astigmatism. Only a chapter of 13 pages is given up to the objective examination of the refraction, the main reliance of the author being placed upon the subjective methods. Although a clear description is made of estimation of refraction in the upright image by the ophthalmoscope, skiascopy is poorly described and dismissed after a couple of pages with the following: "Lastly, it should be remembered that in skiascopy one never knows what part of the eye-ground the refraction is measured." This is a most inaccurate statement. Certainly the Germans have not yet learned the value of this useful method and that by examination in the visual axis the refraction may be more accurately measured than by any other method. Examination of the visual field, the light and color sense is briefly described. Adherence is given to the Hering theory of color vision. (In passing, the reviewer would again refer to the more acceptable theories of Burnett and Oliver, noted in last issue in reviewing book by Wilbrand) in which the differentiation of form and color is not an attribute of the retina but is placed in the brain cells where it properly should be considered. While the hypotheses of Young-Helmholtz (3 nerve theory) and of Hering (3 color substance theory) are plausible yet who can explain by these the fact that there has not yet in all literature been published an authentic case of "white-black" blindness while red-green and blue-yellow color vision persisted? White is the sum of all colors and for the differentiation of color, form and white the same brain cells suffice.) Examination of the pupillary and lid movements is shortly but accurately described. The disturbances of monocular vision, the anomalies of the ocular muscles, paralysis, nystagmus, spasm, strabismus, heterophoria, their meaning and correction are considered.

A chapter is given to visual malingering and simulation.

H. V. W.

POST-DIPHTHERITIC DISEASES OF THE EYES.

SCHIRMER, OTTO (*Die Post-diphtheritischen Erkrankungen des Auges*). *Sammlung zanglöser Abhandlungen aus dem Gebiete der Augenheilkunde*. Verlag von Karl Marhold, Halle, 1896. 26 pp.

By post-diphtheritic disease is meant those affections which appear a few weeks after true Söfller's bacillus diphtheria which are due to its existence in the system. Secondary inoculation upon the conjunctiva from the throat is of seldom occurrence.

Ocular disease after malignant sore throat was first noted in 1749 by Chomel. Accommodative paralysis comes on in one to six weeks, usually three weeks after the diphtheritic attack. It is always binocular. It is difficult to estimate its relative frequency but the researches of Rosenmeyer show that about 8% of diphtheritics acquire paralysis of accommodation. Astigmatism after diphtheria has been noted. It may perhaps be explained by the unmasking of a corneal astigmatism which had hitherto been neutralized by irregular ciliary contraction and which appears after ciliary paralysis. The extrinsic muscles are less frequently affected. The causes of post-diphtheritic paralysis have been variously ascribed to the following: The brain centers may be affected directly; there may be a peripheral neuritis; changes in the centers through blood-vessels and emboli followed later by neuritis; myositis combined with peripheral nerve changes. Visible optic neuritis is seldom seen, there having been but four authentic cases described. He has seen 15 cases of retrobulbar neuritis in some of which partial atrophy of the optic nerves, with diminished vision and contraction of the visual fields, has occurred. In some of these there has also been accommodative paralysis and diplopia due to extensive paralysis. Literature on the subject is fully given.

"A TEXT BOOK ON NERVOUS DISEASES."

By American Authors, edited by F. X. Dercum A. M., M. D., Ph. D., Lea Bros. & Co., 1895. (Reviewed with especial reference to the Chapter on Diseases of the Oculo-cranial Nerves by Dr. de Schweinitz.)

Inasmuch as the American conditions of everyday life differ essentially from those of our European brethren and are thought to underlie the various neuroses to which the American is said to be particularly susceptible, it seems eminently fitting that we should have a Text Book on Nervous Diseases by American authors who have had abundant opportunity to study the anomalies of the nervous system resulting from the high pressure attendant upon American life. This function has been admirably fulfilled in the volume before us. However, it is not our purpose to review the volume as a whole, though we will turn aside a moment to say that it is the best exposition of neurology from the American standpoint that has yet appeared.

Of the two chapters written by ophthalmologists, one (that by Dr. Chas. A. Oliver, on "The Examination of the Eye from the Standpoint of the Neurologist") has already been favorably reviewed in this department, and we desire to add our own praises to those previously recorded. The other chapter that is of especial interest to our readers is entitled "Diseases of the Cranial (2nd, 3rd, 4th and 6th) Nerves," by Dr. DeSchweinitz. This chapter is, in itself, a classic treatise on the affections of these particular nerves, and their relation to the neurologic conditions with which they are allied. The author's treatment of his subject is direct, and yet not brief; of a style that is easily followed. There is shown a nice discrimination

in the selection of such material only as will be interesting and profitable to the neurologue, and at the same time easy of application.

DeSchweinitz accepts Leber's theory as to the inflammatory nature of choked disc and papillitis, claiming that "it best describes, so far as our knowledge goes, the mechanism of optic neuritis." Jonathan Hutchinson's idea of the pathology of internal ocular palsies (referring to the part played by the ciliary ganglion), he pronounces incorrect. He believes in the nuclear origin of the trouble. DeS. draws largely from Bruce for his anatomic data. (Marina has recently resurrected Hutchinson's idea, and questions the existence of the generally accepted centre for the sphincter pupillae in the oculomotor nucleus. See the preceding review of his monograph.) Until the evidence for the existence of a centre for pupillary movements, *in the human subject*, is positively shown, we hesitate to accept unquestioningly either the intra or the extra-cerebral theory *in toto*.

We note with pleasure the author's insistence at three different points, that "transient ocular palsies may be a significant and early sign of locomotor ataxia, and should invariably prompt intimate search for other signs or symptoms of that malady." These conditions are far too often regarded as rheumatic or peripheral, and their real import overlooked; though this charge can be oftener laid at the door of our ocular than at that of our neurologic brethren.

The chapter is an able summary of the knowledge of diseases of the oculo-cranial nerves, and by its comprehensiveness reveals the broad foundation upon which the author's ocular knowledge rests.

REBER.

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"UEBER MULTIPLE AUGENMUSKEL-LÄHMUNGEN, UND IHRE BEZIEHUNGEN ZU DEN SIE BEDINGENDEN, VORZUGSWEISE NERVOSEN KRANKHEITEN."

A. MARINA, of Trieste. Verlag von Franz Deuticke, Leipzig und Wien, 1896.

This excellent monograph has recently been reviewed by Dr. Würdemann in Vol. V, No. 2 of this journal. On re-reading the monograph, we were so impressed with Dr. Marina's views on the nature of the pupillary movements in health and disease that, with full apologies to Dr. Würdemann, we take the liberty to comment at some length on the chapter devoted to the pupil.

He opens the chapter with a critical resume of the experimental aspect of the question of pupillary movements and their supposed centers, following this with comments on the findings in 256 cases (illustrating fully 20 different general and cerebro-spinal diseases), all exhibiting pupillary lesions. Reviewing, for a moment, the arguments to be drawn from the experimental and pathologic phases of the subject, he is led to state that, as yet, no centre for pupillary contraction has been positively proven in the human subject. Quotations from different investigators are freely used to show that the ciliary ganglion is an all-important link in the arc for the light reflex. He refers to the great frequency of iris lesions in syphilis, tabes and progressive paralysis (which latter two diseases are largely thought to be due to some unknown modification of the syphilitic virus). "The pathologic process in this nosologic trinity is a widespread one, including inflammations and degenerations of the peripheral and central nerves. The nuclear atrophy accompanying them is of great moment. * * * * * Reflecting on the manner in which a spinal inflammation produces mydriasis; on the possibilities of the much

neglected ciliary ganglion as a myotic centre; and on the perfect integrity of the optic nerve necessary to the proper performance of the pupillary reflex, we are rather forced to admit that an iridoplegia may occur in any one of the three allied diseases just referred to, in the presence of a perfectly normal oculomotor nucleus. To carry the idea further: when we consider the reflex iris paralysis (Argyll-Robertson pupil), belongs to the initial signs of tabes; that it sometimes persists throughout the whole course of the disease without the least involvement of any other branch of the oculomotor nerve; lastly, bearing in mind how a centre for pupillary contraction *in man* has been sought for in the oculomotor nucleus in vain, it seems reasonable to ask: whether the centre for the sphincter pupillae lies in the oculomotor nucleus? The frequency of iridoplegia in tabes argues for an extra-cerebral centre for pupillary movements; or at least for a second centre interpolated between the oculomotor nucleus and the short ciliary nerves." He details graphically how beautifully in accord with the neuron theory this latter idea is.

As contributory evidence for an extra-cerebral pupillary centre, he mentions the absence of iridic lesions in congenital ophthalmoplegia externa, and in bulbar palsies; also emphasizing that in different neuritides of the oculomotor with or without polyneuritides of other nerves, the pupil may be intact. In his closing lines, he devotes himself to fitting his theory to the Argyll-Robertson phenomenon. His idea is that, "when the gaze is directed to a distant object, the iridic dilator muscle (whose exciting fibres do not penetrate the ciliary ganglion) is stimulated, causing enlargement of the pupil; on the other hand, during the pupillary contraction associated with strong convergence of the eyeballs, inhibition of the pupil-widening apparatus occurs, thus explaining why the light reaction, (active pupillary contraction), is absent, while the convergence reaction, (passive pupillary contraction), remains intact. It may be argued that the convergence reaction occurs even if the patient has not been previously looking into the distance; an argument that is easily answered. The condition of the pupil at any given time is the resultant of the never-ending counter-action of the dilating and contracting apparatus; and in the above phenomenon, an inhibition of the dilator muscle, (which in all probability possesses a certain tonus), is altogether likely." From the foregoing it will be readily seen that the author assumes the existence of the musculus dilator iridis.

Dr. Marina is not always right, (according to the law and the prophets in ophthalmology), but he is interesting. One cannot read his earnest lines without entering more or less into the spirit of the discussion. The chapter is bristling with new thought and should stimulate research into the intimate functions of the ciliary ganglion. The howness and whyness of pupillary movements is, in itself, a profound and far-reaching study. We most heartily commend the chapter, as well as the whole volume, to those who have a penchant for oculomotor problems.

REBER.

DISSEMINATION AND PREVENTION OF PURULENT OPHTHALMIA.

COHN, H. (*Ueber Verbreitung und Verhütung der Augeneiterung der Neugeborenen*). Verlag von Oscar Coblentz, Berlin, 1896.

This book of 110 pages owes its existence to a commission appointed by the Med. Abtheilung der Schles. Gesellschaft in Breslau, consisting of Czerney, Jacobi, Küstner, Neisser and Cohn to report upon the prevention of purulent conjunctivitis in the new-born which had been instigated by a paper of Keilmann who condemned

Crede's method and recommended simple washing of the closed eyelids after birth by tri-chlorid solution. He reported 500 births in Küstner's Woman's Clinic in which there were only eight cases of purulent conjunctivitis.

This is a most valuable work and should be read by all physicians. The first chapter contains a manual of instructions for the general public showing the existence, prevention, causes and treatment before a physician is in attendance. He has secured reports from Breslau in which city 12,000 children were born in the year 1895, of which there were 333 children with blenorrhea reported by physicians, most of which had occurred from childbirths in which midwives had been employed. He gives many tables and statistics, showing the percentage of blind from blenorrhea ranging from 19 per cent up to 30 per cent and more. Statistics concerning the existence of blenorrhea in Germany, Austria, Switzerland and Holland are likewise given.

In a special study of 898 cases of ophthalmia neonatorum the existence of gonococci, the recurrence of cases by the same mother is considered. In regard to the treatment he has reports from the principal specialists in Germany who coincide in the main, recommending nitrate of silver, cold compresses, sublimat washing and in special cases carbolic acid, permanganate of potash, oxycyanide of mercury and boric acid. There is, however, a difference of opinion among them in regard to the prophylaxis given by Crede's method.

A large proportion of the balance of the work is taken up in consideration of Crede's and Kellmann's and other methods of prevention. The author himself considers that Crede's method is essential and obligatory in all cases where there is vaginal discharge and is advisable in nearly all other cases. The great objection advanced by the majority of the opponents of the method is that by its indiscriminate use by nurses and midwives some eyes are damaged and in some others artificial conjunctivitis set up. However, in the hands of physicians such must be of infrequent occurrence.

In closing he reviews his statistics and states that they are relatively free from error. It must be concluded that by proper prevention and treatment the greater majority of cases blind from neonatorum could have been absolutely prevented. He considers that statistics should be compiled by the public authorities and yearly reports made from every eye clinic and hospitals and from all oculists, answering the following questions: How many blenorrheal cases have been observed on one side and how many on both sides? In how many cases were gonococci found? How many cases were healed without damage? How many cases did not receive full treatment? In how many cases did disease of the cornea occur during treatment? In how many cases were maculae of the cornea left after treatment? How many became blind in one or both eyes?

He considers that Crede's method should be used and taught to students; that these cases must be treated by the physician daily and have a skilled nurse as frequent treatment is absolutely necessary.

A memorial has been addressed to the Prussian Minister of Public Health craving the gathering of government statistics concerning this disease. He closes with the following sentence, which he holds as a motto: "*Blenorrhea neonatorum can and must be driven out of all civilized countries.*"

H. V. W.

